# Covid-19 and beyond: From (forced) remote teaching and learning to 'the new normal' in higher education

Edited by
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Covid-19 and beyond: From (forced) remote teaching and learning to 'the new normal' in higher education

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Editorial: COVID-19 and beyond: From (forced) remote teaching and learning to "the new normal" in higher education

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Editorial on the Research Topic
COVID-19 and beyond: From (forced) remote teaching and learning to "the new normal" in higher education

The COVID-19 pandemic brought extraordinary disruption to the higher education (HE) landscape. Yet, the sector responded in a manner that could be described as ecumenical, as universities from virtually every country on the globe, almost in unison, closed their campuses, sent their staff and students home, and moved all teaching and learning online.

If the pandemic was unprecedented, so, too, was the speed with which faculty were making the (forced) move to remote teaching, giving them little time to process the abrupt changes affecting their professional (and personal) lives. Seemingly overnight, academics had to transform face-to-face classes into forms involving fully digital delivery and assessment; "learning on-the-fly" using novel technologies; and finding new ways to support and inspire students and their learning—all while operating remotely from their homes. Personally, while coping with becoming house-bound and concerned about the health of their families and selves, faculty had to become schoolteachers for their own children; with some forced to take pay cuts or be furloughed.

Students had similar concerns about their own health and that of loved ones, but also how to adjust to changes in their HE experiences, sometimes including fundamental shifts in their living arrangements such as being despatched from campus dwellings back to family homes. Even senior HE managers, fearing long-term economic consequences, were uncertain about meeting institutional obligations to students.

In developing this Research Topic, we, the guest editors (all of whom are academics in our respective disciplines and countries) sought to capture the impacts of the COVID-19 crisis on the HE landscape—*as it was happening*—by providing opportunity for the international academic community to pause and reflect on what was transpiring; to explore the medium and long-term consequences of the campus closures and commensurate shifts to digital platforms; and to prepare for the future, perhaps even a "new normal."

Our aim was to be inclusive, so we welcomed proposals from the broadest spectrum of voices in higher education. And with 44 contributions, we believe we have achieved that goal. Thus, a defining feature of this Research Topic is its breadth and diversity, with contributions from 20 countries, in relation to a comprehensive set of academic disciplines and contexts.

Collectively, the contributions to this Research Topic relate to three over-arching themes: (a) Higher Education Delivery; (b) Lives and Livelihoods; and (c) Reflections on Past and Future. Within each theme, there are *Original Research* articles describing studies that were strategically and purposefully carried out in response to the pandemic's immediate impact on HE. There are also *Perspectives*, *Opinions*, and *Brief Research Reports* reflecting, in some cases, positive experiences; but overwhelmingly, the challenges that staff and students faced at the beginning—and for some, continue to face, in the aftermath of COVID-19.

Higher education delivery

This theme captured the challenges of *emergency remote teaching and learning*; in particular, the response to the sudden shift to fully digital formats that was necessary to accommodate the lockdowns and campus closures. How lecturers and students adapted (or not) to the changed teaching and learning environments was the primary focus of these articles. Within this theme, the single most salient message to come from the contributions is the fact that emergency remote teaching in response to a crisis is nothing like deliberately-designed online teaching and learning.

The majority of manuscripts within this subsection are based on original research carried out in response to the sudden shifts to remote teaching and learning contexts. There were slightly more studies focused principally on the impact this move had on students (Alatni et al.; Biwer et al.; Dikaya et al.; Hoss et al.; Millar et al.), relative to that of lecturers (Erlam et al.; Feldhammer-Kahr et al.). Several studies looked at both participant groups. In New Zealand, for instance, Trafford et al. use cogenerative dialogue with a small group of lecturers and students, allowing them to reflect on how the sudden changes in teaching and learning may have impacted on their educational practices. Lobos Peña et al., from Chile, investigate if the professors' online teaching expectations and previous experience have influenced students' academic performance. They find that students' academic performance is a variable more likely influenced by attributes associated with the students, and not related to the professors' generally positive expectations. Finding the professors to have a relatively positive outlook is something that Lobos Peña et al. have in common with several other papers (Erlam et al.; Feldhammer-Kahr et al.; Trafford et al.).

The teaching and learning frameworks, more so than the people themselves, were also the focus of two papers (Chaturvedi et al.; Verde and Valero). In their *Perspective*, Chaturvedi et al. summarize what they found to be the seven principal teaching methods to create an effective *blended* environment for students and staff in Indian business schools. Verde and Valero explore the pros and cons of three different types of teaching (i.e., presence learning, blended learning, and distance education) adopted by two Spanish universities in response to COVID-19.

A common objective in this subset of articles was to identify sources of influence or strategies utilized to cope or adapt (Biwer et al.; Chaturvedi et al.; Dikaya et al.; Feldhammer-Kahr et al.; Hoss et al.), most of which were interpersonal or attitudinal. One study looked instead at students' engagement with *Blackboard*—their

institution's learning management system—and the patterns that proved most strategic to the students' achievement (Millar et al.).

Not surprising, the COVID-19 context, campus closures, and interruptions to the standard teaching and learning formats, were often framed in a negative light; a challenge to be overcome or dealt with. Yet, a number of studies also chose to look for or report on the positive impact or outcomes associated with these changes (Dikaya et al.; Erlam et al.; Feldhammer-Kahr et al.; Hoss et al.). For example, Hoss et al., in their qualitative study of German students' negative and positive statements, report that while the number of negative statements outnumbers the positive ones, some students found the conversion to remote learning to be advantageous, particularly in time savings, and increased flexibility in regards to their time and work management. Similarly, another study of Austrian and German lecturers found that some reported a sense of satisfaction from the situation—particularly when it was regarded as a challenge more so than a threat (Feldhammer-Kahr et al.).

Practice degrees

A special sub-theme of the *Higher Education Delivery* section was devoted to the unique impact that the lockdowns had on "practice" degrees—those courses/programmes with hands-on training requirements—and how this was managed in the wake of lockdowns and social distancing. In short, the pandemic became a once-in-a-lifetime opportunity to study *in vivo* the impact that online remote learning had on students' skills development in different disciplines, including English learned as a foreign language (Liu and Yuan), social work training (Fronek et al.; Neamtu and Faludi; Sarbu and Unwin), psychology (Talsma et al.), medicine (Hamamoto Filho et al.), the study of music (Nusseck and Spahn; Ritchie and Sharpe), and that of Sport and Recreation (Godber and Atkins). Empirical findings gathered in different parts of the globe (Australia, Brazil, China, Germany, New Zealand, Romania, and the U.K.), somewhat surprisingly showed that during the COVID-19 worldwide lockdowns, the move to online learning still allowed some HE students undertaking practice degrees, to continue their studies.

This particular context had some positive effects, such as greater opportunities to develop autonomy and self-regulated learning skills, but also some negative effects, such as high levels of anxiety and greater difficulty in developing interpersonal or problem-solving skills—reinforcing the belief that in-person interactions are preferred, if not vital, when learning certain skills or forming interpersonal connections with others. These studies remind us that the learning context can have a significant influence on students' academic performance outcomes and perceptions of their learning processes.

Programmes that train social and healthcare professionals, such as social work and psychology, faced challenges with lockdowns that thwarted apprenticeships and work placements for HE students—crucial components of their professional training. Forced social distancing and lockdowns compelled institutions to either cancel or postpone placements, which had the potential to stall students' progress. Placement agencies and internship environments were left to their own devices, generating

inconsistencies in students' individual experiences and arousing fear that this loss of direct contact between service users and professionals might shift permanently (Sarbu and Unwin).

Godber and Atkins undertook a collaborative autoethnographic study, using a socio-ecological systems framework to organize their own critical self-reflections as lecturers experiencing the same adaptation challenges as their students during the lockdown. They highlight how New Zealand students in Sports and Recreation struggled in the absence of practical learning opportunities, and conclude that the impact of these changes was under-estimated, testing individuals and institutions to new limits.

Several studies focused on the matter of assessments in practice degrees. For example, within the music discipline, Ritchie and Sharpe found that in preparation for assessments, the students choosing to videotape their performance showed better versatility in their preparation methods, compared with students who chose to postpone their assessments, demonstrating important links between resilience, self-efficacy and wellbeing. In their *Opinion* paper, Hamamoto Filho et al. reflect on online methods to assess acquisition of knowledge and "know-how" of Brazilian medical students, suggesting a shift from high-stakes assessments to multiple low-stakes assessments that could remain beyond the COVID-19 pandemic.

One programme that seems to have adapted well is the *Australian Postgraduate Psychology Simulation Education Working Group,* who have recommended the adoption of standardized guidelines to include *simulation-based learning*—perceived as "not an inferior substitute to placements"—as an innovative and safe alternative to in-person internships with real clients (APPSEWG).

Finally, as an adjunct to this sub-section, we include two papers on international student experience. From Poland, a study comparing the psychological and academic outcomes for international students, who either returned to their country of origin or remained in the host country, found no significant relationship for country-of-residence (Wilczewski et al.). From Australia, Fronek et al. share their experience of how a social work faculty and community members came together to support international students forced to stay on campus during lockdown.

Lives and livelihoods

While the campus closures and lockdowns created numerous professional challenges, the nature of the pandemic and its need for social isolation also took a personal toll on staff and students. The negative effects of long-term isolation, and their impact on physical and mental health, were the focus on this second theme.

Research on the student population highlighted negative impacts such as academic stress and poor emotional wellbeing (Clabaugh et al.); how pre-existing mental health diagnoses intersected with coping behaviors and vulnerability in women students (Misca and Thornton); how depressive symptoms mediated worsening of academic skills (Calandri et al.); and how student concerns about degree completion and future job prospects affected student wellbeing (Plakhotnik et al.).

However, positive psychological experiences (i.e., higher belonging and challenge, and lower threat) were found to be associated with lower rates of depression and stress, greater life satisfaction and happiness, and greater optimism about the future (Syropoulos et al.). Although anxiety, boredom, and frustration were present among Mexican students during confinement, the primary emotions were found to be gratitude, joy, and hope, and the main coping strategies used were focused on facing and reassessing the situation (Gaeta et al.).

The overwhelming recommendation from contributions to this theme was a need to increase support for students. Consequently, papers have explored how positive education, and specifically the "PERMA" wellbeing framework, has inspired the development of a wellbeing program for a U.K. university context (Morgan and Simmons), as well as the CRAFT program, based on mindfulness, yoga, positive psychology, and emotional intelligence, to improve HE student musicians' health and wellbeing during the lockdown in Spain (Bartos et al.).

In exploring the impact of the pandemic and emergency remote instruction on college and university instructors' wellbeing, a Polish study highlighted faculty's anxiety, loneliness and apprehension about job stability (Jelińska and Paradowski). Two *Opinion Pieces* reflect on the gender inequalities, which appear to be exacerbated by the changes to working practices (Augustus), especially for academic parents (Harrop).

Reflections on past and future

As mentioned, the special issue contains an impressive range of contributions from institutions of HE adjusting to COVID-19 realities. Often a crisis can highlight existing values, vulnerabilities and priorities and it seems that COVID-19 is no different. For example, shifting to online learning highlighted vulnerabilities of digital exclusion in Kenya (Osabwa) and feelings of "techno-inefficacy" in Spain, leading to "techno-stress" for some face-to-face universities forced to go online (Penado Abilleira et al.). As for existing values, COVID-19 prompted Scherman and Snow to restate the importance of shared physical space, campus culture, and human connection—all of which help to develop virtues and mitigate students' feelings of loneliness, depression, and alienation. Similarly, in the context of teaching languages in Australia, Dutton reasserts that balancing autonomy and community remains key for learning languages online. And, while some authors stressed ongoing values, others were more directly focused on responding to pandemic effects by exploring how to enhance human connection online, ranging from personal reflections of remotely teaching Molecular Cell Biology in the Netherlands (de Vries); to conducting large scale surveys of remote pedagogical techniques (Nguyen et al.). In a similar vein, Wang et al. highlight the importance of instructors for learning in cloud-based virtual classrooms and Dumulescu et al. promote emotionally safe, self-directed online learning in Romania.

Vast unpredictable events such as COVID-19 can also bring about deep changes (Dumulescu and Mutiu), and potential for such change is identified by other authors in the special issue. For example, in New Zealand, Conn et al. contemplate a wider agenda in public health for transformative education; and advocate a shift from a "factory model of education" to a model of "personalized learning." Similarly—and pertaining to HE Policies

for Transnational Education (TNE) programmes between the U.K. and China—Bremner et al. promote the worth of management tools for scenario planning and crisis management for effectively reducing disruption to teaching and learning.

In summary

Looking back to the beginning of the pandemic, the HE allied and contemporaneous decisions to shift all teaching and learning online must have seemed an effective win-win solution for the sector. The perception seemed to be that with the right technology, and quickly assembled knowledge base for operating that tech, staff and students would both be capable and motivated to move to a digital format from the safety of their respective homes. Thus, providing the essential social distancing that would reduce the spread of the virus, and allow the continuation of all teaching and learning.

What this collection of articles overwhelmingly reveals is that as HE educators, our major mistake was thinking that moving courses online would make them "online courses." Those who regularly deliver online/distance courses will understand this distinction. Prior to the COVID-19 pandemic, the majority of academics authoring papers in this collection, were teaching classes designed to be delivered live, in a physical space shared with their students. So, even though everyone could log in and enter a shared virtual space, many of the important features of the HE relationship were lost. The situation was exacerbated by the fact that, almost overnight, staff were expected to become experts in a host of digital technologies necessary to remotely deliver their curriculum; and then, to ensure that students were equally equipped—all while managing a myriad of additional COVID-19-related personal matters.

Yet, in the early chaos of this shared response for keeping universities running, moments of inspirational cooperation and accord were happening in the way the international academic community supported one another—communicating through online networks, asking for advice, and sharing knowledge. In fact, for the first-author, it was this amiable sharing of information that lead her to propose this Research Topic. It seemed like we were all in this together, and working collegially to support one another.

Even so, this collection belies the notion of a simple shift to online; the reality—as we see here—was far more complex. On the other hand, this collection of articles also shows how resilient HE lecturers and students are, as they (more often than not) overcame the obstacles (both professional and personal), and adapted to the necessary changes.

A unifying feature of this collection is its currency and global relevance—even as the COVID-19 pandemic begins to loosen its grip on the world—due to the forward focus of many of these articles, who have sought to apply what they have learned to HE contexts beyond that of the pandemic.

Be that as it may, some questions remain. For some students, the "emergency remote learning" environment is all that they have known, due to the COVID-19 variants that resulted in repeated campus closures over an extended period. What impact might this have on this cohort, for their ongoing studies, or the value of their education beyond graduation?

In respect of the socio-emotional toll that the lengthy periods of isolation have had on students and staff, some of which was reported here, 2 years on from the start of COVID-19, the World Health Organization reports significant increases in rates of depression worldwide (https://www.who.int/news/item/02-03-2022-covid-19-pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide). No doubt, faculty and student make up some of those statistics. On the other hand, many of the service sectors relied upon to address this health concern, rely themselves on HE to train their practitioners. Can or will HE be able to address these post-COVID consequences?

Finally, we know little of the long-term impact that the COVID-19 institutional changes will be having on HE. Many of the contributions in this collection report successful adaption to the fully digital environment, which will no doubt influence the ongoing delivery of HE curriculum. Will that adjustment entice universities to remain "online"? Will the pedagogical frameworks that informed most in-person teaching and learning need to be altered so as to accommodate the fully digital or blended revisions? Is a return to pre-COVID-19 teaching and learning modalities even possible, or are we destined for a "new normal" in HE? It is our hope that we do not need to wait for the next global pandemic before we are able to answer these, and other questions.

Author contributions

All authors contributed to the writing of the editorial and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Technostress in Spanish University Teachers During the COVID-19 Pandemic

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One of the measures adopted by the government of Spain during the COVID-19 pandemic has been the elimination of face-to-face classes in all universities, requiring that all teachers had to conduct their classes in an online mode. The objective of this article is to study how this adaptation among university teachers affected their job performance due to the technostress (objective and subjective) that they may have suffered. Based on the person-environment misfit theory (P-E fit theory), the sample consisted of 239 teachers from face-to-face and online universities in Spain who were asked to identify the type of technostress, feelings of technostress, and impact on job performance as a result of online teaching due to the COVID-19 pandemic. Results show that teachers who suffered the most from the negative consequences of technology have been female teachers from face-to-face universities who are older, have more years of experience, and consequently, hold a higher position. Despite previous results none of the above variables have been significant in explaining the decline in job performance during confinement. It was also observed that although the effect on job performance was similar for online teachers as well as face-to-face teachers, the variables that explained this effect were different. For the online teachers, there was a misfit between the demands and resources, which are explained based on the previous theory (P-E fit theory). Teachers from face-to-face universities pointed to the lack of instructions from their organization, along with subjective feelings of techno-inefficacy, as the reasons behind the decline in job performance during the lockdown period. Looking ahead to future research on the incorporation of information and communications technology in teaching work, it is necessary to consider variables associated with technostress, both objective and subjective, in order to increase the effectiveness of integrating emerging technology into teaching work.

Keywords: technostress, university, teacher, job performance, COVID-19

INTRODUCTION

It was in the 1980s, in the book *Technostress: The Human Cost of the Computer Revolution* (Brod, 1984), that technostress was first spoken of as an adaptive disease caused by people's inability to face new technologies in a healthy way. Since then, many authors have attempted to define the term by broadening and qualifying these initial assumptions. Some, like Weil and Rosen (1997) have spoken of negative impacts on attitudes, thoughts, or behaviors, caused directly or indirectly through technology.

In the Spanish context, Salanova (2003) refers to technostress associated with the use of information and communications technology (ICT) as follows:

A negative psychological state related to the use of ICT or a threat to its use in the future. This state is conditioned by the perception of a mismatch between demands and resources related to the use of ICTs, leading to a high level of unpleasant psychophysiological activation and the development of negative attitudes towards ICT (Salanova, 2003, p. 231).

Following this definition, Llorens et al. (2011) focused their efforts on studying the different components of the subjective experience of technostress by grouping them into what they called *technostrain*. This concept is understood as the negative psychological experience derived from the stress that occurs when using technology (Llorens et al., 2011). For the authors, this would configure the affective dimension of technostress syndrome. *Technostrain* includes anxiety (techno-anxiety) and fatigue (techno-fatigue) related to technology, skepticism (techno-skepticism) caused by it, and inefficacy (techno-inefficacy) when using technological resources.

The anxiety dimension (techno-anxiety) includes psychological anxiety (fear of damaging the computer), social anxiety (fear of being replaced by a machine), and anxiety in operation (inability to use technology). In addition to anxiety, people experience feelings of fatigue (techno-fatigue), tiredness, and mental and cognitive exhaustion (e.g., "When I finish working with technology, I feel exhausted") due to the use of technology. This fatigue is related to the development of negative attitudes toward technology (Salanova et al., 2007).

Skepticism (techno-skepticism) constitutes the attitudinal dimension of technostress and refers to the negative evaluations generated by the use of technology, such as an indifference or a disconnected attitude toward technology (e.g., "As times goes by technology interests me less and less") (Llorens et al., 2011).

Finally, Llorens et al. (2011) differentiate the cognitive dimension of technostress (techno-ineffectiveness) by describing it as negative thoughts about one's ability to use technology successfully (e.g., "In my opinion, I am ineffective using technology").

Users who experience *technostrain* will present high levels of unpleasant physiological activation that materialize in anxiety, tension, and discomfort due to the current or future use of ICT. The user may experience anxiety due to a feeling of not having enough time to respond to the amount of digital data that they receive in their day-to-day work. One example of this may be the immediacy of responding to incoming emails or mobile messages in a short time. On the other hand, users may have a negative attitude toward the use of ICTs because they may think that they are a hindrance due to errors caused by the computer system or to their work process. These users do not see the benefits of ICT because they are sometimes not capable of using them.

In addition to the subjective experience or sensation of technostress, multiple theories have tried to objectify this phenomenon, indicating that the unpleasant sensation of technostress is produced by an imbalance between people and the technological environment in which they carry out their work, focusing on objective variables instead of the subjective sensation or the feeling that they cause in the person.

Within this objective vision of the phenomenon of the technostress person-environment misfit theory (P-E fit theory) (Harrison, 1978; Edwards, 1996; Edwards et al., 1998), an assumption exists that there is an equilibrium between people and their environment; when this relationship is out of balance, tension is generated (Ayyagari et al., 2011). Stress is caused neither by the person nor the environment but appears when there is no adjustment between the two (e.g., between the needs of the person and the resources of the environment, or between the aptitudes and abilities of the person and the demands of the environment). Thus, technostress is conceptualized as a misfit between a person and the environment. It is not only limited by technology itself but also by the organization that has established the requirements for its use, and the members of the organization that, on multiple occasions, have an influence on the individual's use of technology (Avanzi et al., 2018).

Most of the studies on the negative effects of technostress have focused on a business or industrial work context (Ragu-Nathan et al., 2008; Jung et al., 2012; Fuglseth and Sørebø, 2014; Jena, 2015; Tarafdar et al., 2015; Hsiao, 2017; Marchiori et al., 2019; Salanova, 2020); however, an increasing amount of research is currently being focused on the educational context (Özgür, 2020; Penado Abilleira et al., 2020).

Llorens et al. (2011) point out that teaching is one of the most stressful professions in the world due to continuous changes derived from scientific and technological advances that have occurred from the 1990s to the present. Today, the role of the teacher has evolved from a simple "transmitter of knowledge" to a "complex designer of learning environments" (Gros and Silva, 2005), where technology is used as a teaching-learning method. Teachers today must attend to the interaction between three main components of the learning environment: content, pedagogy, and technology. This is considered necessary as teachers have the so-called "knowledge of technological pedagogical content" (TPACK) (Koehler and Mishra, 2005; Mishra and Koehler, 2006; Rienties et al., 2013; Özgür, 2020; Schildkamp et al., 2020). Today's teachers are expected to integrate technology both positively and effectively into their teaching in the classroom (Graham et al., 2009), and they constantly struggle with the time available to keep pace with emerging technology and with the associated innovations in pedagogy (Tarus et al., 2015; Voet and De Wever, 2017). In addition, teachers usually see technology as tools for lesson preparation, knowledge delivery, or to attract students, but they lack adequate skills and competencies in designing and implementing the constructive use of technology in the teaching and learning process (Chen, 2008; Munyengabe et al., 2017). The continuous upgrading of technology exposes teachers to constant technostress because teachers do not always have the knowledge required to use new and updated technologies (Altınay-Gazi and Altınay-Aksal, 2017; Li and Wang, 2020). However, teachers' ability to integrate technology into classroom pedagogically is crucial to educational innovation (Koh et al., 2017; Schildkamp et al., 2020).

Based on the P-E fit theory, Al-Fudail and Mellar (2008) proposed a teacher-technology interaction model that shows how

teachers experience technostress when there is a discrepancy between their characteristics (e.g., abilities and needs) and school technology support (e.g., training and technical support). The competencies and attributes of the teaching staff are essential when incorporating technology into teaching work. This statement is even more evident in times of a pandemic; hence, there is a proliferation of studies that have focused attention on this topic and have demonstrated the extent to which this research is important (Bruggeman et al., 2021).

Currently, university teaching work is developed in a context where technology is very present but is not always well integrated into daily teaching. The lockdown of teaching centers caused by the pandemic has left teachers improvising new forms of teaching resembling "emergency remote teaching" (Hodges et al., 2020; Mohmmed et al., 2020), than quality online teaching.

Of the many ways in which teaching is being carried out today, we understand that the daily work of online universities is 100% based on technology as a means of approaching students, transmitting content, and carrying out evaluation activities, without any type of in-person contact. On the other hand, face-to-face teaching uses personal contact in situations as a fundamental strategy of the teacher-learner process, regardless of the fact that there are virtual platforms that complement this action and support the content transmission process.

Understanding these two teaching modalities in these terms, it can be assumed that online universities, in principle, have implemented more ways of acting through ICT and that, therefore, their faculty members may experience less misfit (technostress) between the demands of the institution and their own needs regarding technology. In face-to-face universities, these imbalances may be greater due to the lack of a tradition of fully integrating technology in teaching.

Until now, the study of technostress has been carried out either objectively or by considering the subjective nature of the said phenomenon. Therefore, an integrative vision that relates both spheres within the work environment is necessary. Based on the above, the purpose of the present investigation is to study the levels and types of technostress that professors at a Spanish university reported during the isolation and confinement measures of the population due to the COVID-19 pandemic. During this period, all teaching activities of the university had to be conducted online.

Based on the hypothesis that, in online universities, teachers receive the necessary support to overcome technostress caused by technological inadequacy and that, in contrast, face-to-face universities have had to adapt quickly to online teaching without sufficient training and with a high level of improvisation, a higher level of technostress is expected in teachers from face-to-face universities, compared to those who routinely performed their teaching functions online.

MATERIALS AND METHODS

Procedure and Participants

The sample comprised of 239 teachers (46.6% men and 53.4% women) from Spanish universities, aged between 26 and 69 years (M = 47.03; SD = 10.17). The participating teachers had experience teaching for an average of 15 years (SD = 12.20).

Among the participating university professors, 71.5% were at universities that, without taking into account the measures established during confinement, carried out 100% of their teaching through direct student-teacher interaction (i.e., face-to-face). In this scenario, students were required to travel to the university in order to receive content from teachers without using any type of digital or online platform. The remaining teachers (28.5%) only had experience interacting with their students through the use of virtual classrooms or digital platforms (i.e., without any physical contact between the student and the teacher).

The questionnaire was sent via email to participants to specify the objectives of the research, identification of the authors of the study, and anonymity of the answers provided. The personal data collected would not allow for the identification of the teachers, thus complying with the indications received by the ethics committee of the universities involved and the regulation of personal data, as well as the recommendations of the Declaration of Helsinki (2016/679) approved by the European Parliament of the European Union.

Teachers were asked for their consent to participate in the study and to extract information for the sole and exclusive purpose of the research. To do this, a mandatory question was introduced prior to viewing the questionnaire, which, if not answered in the affirmative, prevented completion of the questionnaire.

The questionnaire was distributed via email using the official distribution lists of the participating universities. The response percentage has been 10%, which is in line with participation rates in similar types of research (Li and Wang, 2020; Özgür, 2020).

Data collection began in mid-April (April 17, 2020), which coincided with the month of confinement of the population due to the state of alarm decreed by the government of Spain caused by the COVID-19 pandemic, and ended a month later (May 16, 2020), when the first deconfinement measures occurred.

During the data collection period, all face-to-face teaching activities at official education centers (e.g., nursery schools, primary, secondary, high schools, vocational training centers, and universities) were suspended and had to be carried out online or remotely.

Measures

The **technostress questionnaire** (Wang and Li, 2019), based on a multidimensional person-environment model to estimate the phenomenon of technostress among university teachers, was used. In the instrument, technostress was conceptualized as the result of a maladjustment or misfit in three main areas of people's interaction with the environment in which they work: from person to organization (P-O; person-organization misfit), from person to technology (P-T; person-technology misfit), and from people to each other (P-P; person-people technology). The maladjustment of people to the organization and technology was also conceptualized using a double path: on the one hand, the lack of abilities of the subjects and, on the other, a lack of resources to adapt to changes.

The misfit of the person to the organization (P-O) encompasses both the maladjustment of the abilities of the subjects in relation to the new demands of their job conditions (A-D; abilities-demands misfit) as well as the lack of support or resources on the part of the institution in the face of the new needs of teachers (N-S; needs-supplies misfit).

The misfit of the person to technology (P-T) assumes that the technological skills of the teachers will quickly become obsolete due to the constant change in the technological and information systems, which forces them to work faster and with greater technological demands (A-D; abilities-demands misfit). Likewise, the inappropriate use of technology may result from the use of technological tools that are not adequate to the task or from a lack of customization of the available tools (N-S; needs-supplies misfit).

The misfit of people with each other (P-P) is conceptualized as the lack of support on the part of other colleagues when carrying out academic tasks, which can increase the feeling of uselessness of new technologies and increase technostress.

The scale proposed by the authors comprised of 22 items that the user had to rate on a five-point Likert scale (1 = Strongly disagree, and 5 = Strongly agree). In the finalized, multidimensional P-E misfit scale of technostress (total score ranging from 22 to 110), the higher the score, the greater the level of technostress. Specifically, a score of 22 indicated the absence of technostress, scores of 23–65 corresponded to a mild level of technostress, scores of 66–87 indicated a moderate level of technostress, and scores $\geq$88 corresponded to a severe level of technostress (Wang and Li, 2019). The original validation of the instrument showed good reliability, with Cronbach's Alpha coefficients ranging from 0.79 to 0.90 in the assessed dimensions.

The questionnaire offered an objective measure of technostress based on the misfit between demands and resources while ignoring the subjective impact of this imbalance on the individual.

The **Salanova questionnaire** (Salanova, 2003) was used to assess the subjective sensation of technostress. This questionnaire conceives technostress as the psychosocial damage produced by technology in three dimensions: the affective dimension (anxiety vs. fatigue), the attitudinal dimension (skeptical attitude toward technology), and the cognitive dimension (beliefs of ineffectiveness in the use of technology).

The items on these scales were answered by teachers who use ICT in their work. The questionnaire was answered using a Likert-type frequency scale ranging from 0 (not at all/never) to 6 (always/every day). Internal consistency tests corroborated the reliability of the scale with a Cronbach's Alpha score that exceeded the cut-off point of 0.70 on all scales, with subscales ranging from 0.83 to 0.93.

In order to obtain the scores of each scale (i.e., fatigue, anxiety, skepticism, and ineffectiveness), the scores of the items were added and then divided by the number of items of the scale to achieve the result. This established the ranges reflected in the table below (see **Table 1**).

To observe the effect of technostress (in its objective and subjective dimensions) on the performance of university teachers, a questionnaire adapted from Tarafdar et al. (2010) for the

TABLE 1 | Scores ranges of the Salanova (2003) technostress scale.

		Anxiety	Fatigue	Skepticism	Inefficacy
Very Low	>5%	0.00	0.00	0.00	0.00
Low	5–25%	0.01–0.25	0.01–0.25	0.00	0.00
Medium (Low)	25–50%	0.26–1.00	0.26–1.00	0.01–1.00	0.01–0.75
Medium (High)	50–75%	1.01–2.00	1.01–2.25	1.01–2.00	0.76–1.75
High	75–95%	2.01–3.25	2.26–4.18	2.01–4.01	1.76–3.02
Very High	>95%	>3.25	>4.18	>4.01	>3.02

estimation **of job performance** was used. This questionnaire contained six elements. Examples of these elements include: "*ICT in my university improves the quality of my work*" and "*ICT in my university improves my labor productivity.*" The same questionnaire was used in the research by Wang and Li (2019). A reported Cronbach's Alpha of 0.91 was obtained for this instrument.

Statistical Analyses

To obtain the psychometric properties of the questionnaire, a reliability analysis was performed by calculating Cronbach's Alpha statistic.

For the comparison of the scores obtained between the different groups, Student *t*-tests or Chi-square tests were performed depending on the type of variable used. The correlations observed between the scales and subscales of the instruments were obtained using Pearson's R statistics.

To estimate the predictive models of technostress in the teaching performance of university professors, a structural equation model (SEM) was carried out with the considered variables. The estimation method was unweighted least squares (ULS), and to value the adjustment of the model, the following indices were used: goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square residual index (RMR), normed fit index (NFI), and relative fit index (RFI). In accordance with Kline (2016), the values showed a good model fit, as RMR $\leq$ 0.08, and GFI, AGFI, NFI, and RFI > 0.90.

All analyses were performed using IBM SPSS statistical software (version 25) and AMOS extension for SPSS.

RESULTS

Reliability Analysis

The reliability analysis carried out on the scales and questionnaires used showed good statistical results for both the global scales and the subfactors or dimensions, exceeding the cut-off point of 0.70 (see **Table 2**).

Prevalence Analysis

The results obtained in the Wang and Li (2019) technostress questionnaire showed a mild level of technostress in the sample, with significant differences depending on the type of university in which teachers carried out their educational functions [χ^2 (1) = 44.389, $p < 0.001$]. This indicated a greater presence of moderate technostress in the teachers from the face-to-face

TABLE 2 | Reliability of the scales used.

	Total
Wang and Li, 2019	0.954
ADO	0.915
NSO	0.826
ADT	0.861
NST	0.856
PPF	0.841
Salanova, 2003	0.953
ANS	0.890
FAT	0.956
SKE	0.908
INEF	0.894
Tarafdar et al. (2010)	0.917

ADO, abilities-demands organization misfit; NSO, needs-supplies organization misfit; ADT, abilities-demands technology misfit; NST, needs-supplies technology misfit; P-P, person-people misfit; ANS, anxiety; FAT, fatigue; SKE, skepticism; INEF, inefficacy.

TABLE 3 | Percentage of the sample at the different levels of technostress (Wang and Li, 2019) according to the type of university and gender.

	Total	Online	Face-to-face	Men	Women
Absence	4.2	14.7	0	4.5	3.9
Mild	73.2	79.4	70.8	76.6	70.1
Moderate	20.1	4.4	26.3	16.2	23.6
Severe	2.5	1.5	2.9	2.7	2.4

TABLE 4 | Average scores obtained in the Wang and Li (2019) technostress questionnaire according to the type of university.

	Total	Online	Face-to-face	Men	Women
ADO	2.1770	1.7978	2.3278	2.1667	2.1953
NSO	2.3699	1.7316	2.6238	2.4054	2.3458
ADT	2.3926	1.7721	2.6394	2.3266	2.4573
NST	2.1341	1.6382	2.3313	2.0968	2.1756
PPF	2.3421	1.6912	2.6009	2.3041	2.3819
TOTAL	2.2831	1.7262	2.5046	2.2599	2.3112

TABLE 5 | Pearson correlations between Wang and Li (2019) technostress questionnaire and age and years of experience.

	Age	Years of experience	ADO	NSO	ADT	NNS	PPF
Age	1						
Years of experience	0.672**	1					
ADO	0.285**	0.290**	1				
NSO	0.257**	0.330**	0.570**	1			
ADT	0.315**	0.362**	0.826**	0.677**	1		
NNE	0.298**	0.347**	0.702**	0.732**	0.755**	1	
PPF	0.330**	0.361**	0.549**	0.666**	0.619**	0.688**	1

**p < 0.01.

universities (26.3%), while 14.7% of the participants affirmed having a total absence of this variable. In relation to gender, results showed significant differences, indicating that women suffer more technostress compared to their male colleagues [χ^2 (1) = 314.389, $p < 0.001$] (see **Table 3**).

Significant differences in the levels of technostress depending on the type of university were maintained when the average scores of each of the dimensions or factors that make up the questionnaire were considered.

Compared to their peers who performed teaching functions at an online university, teachers from face-to-face universities presented the highest scores in all the subfactors considered in the scale: those related to the organization {ADO [$t(237) = -3.708$, $p < 0.001$; $d = 0.53$]; NSO [$t(237) = -6.694$, $p < 0.001$; $d = 0.89$]}, those related to technology {ADT [$t(237) = -5.836$, $p < 0.001$; $d = 0.87$]; NST [$t(237) = -5.435$, $p < 0.001$; $d = 0.69$]}, and those related to interactions between people {PPF [$t(237) = -6.604$, $p < 0.001$; $d = 0.91$]}. According to gender, women appear to suffer greater technostress compared to men, although these differences were not considered significant (see **Table 4**).

For the remaining variables, the results show a greater presence of general technostress related to age and years of teaching experience. This may indicate that the older and more experienced teachers are those who, to a greater extent, suffered the most negative consequences of technology (see **Table 5**).

In Salanova's (2003) technostress questionnaire, the results showed that the type of university had an influence on the subjective feeling of technostress, both on a global scale as well as in the estimated sub-dimensions.

Differences can be found by the ranges obtained in the following subscale: techno-anxiety [χ^2 (5) = 14.706, $p < 0.05$], techno-fatigue [χ^2 (4) = 36.034, $p < 0.001$], techno-skepticism [χ^2 (4) = 34.983, $p < 0.001$], and techno-effectiveness [χ^2 (4) = 21.202, $p < 0.001$]. These results indicate a greater subjective sensation of technostress in face-to-face universities than in online universities. If the gender of participants was considered, significantly higher results were observed in female

teachers across all dimensions included in the questionnaire: techno-anxiety [χ^2 (5) = 14.706, $p < 0.05$], techno-fatigue [χ^2 (5) = 36.034, $p < 0.001$], techno-skepticism [χ^2 (4) = 34.983, $p < 0.001$], and techno-effectiveness [χ^2 (4) = 21.202, $p < 0.001$] (see **Table 6**).

Significant differences were observed in the mean scores obtained for each of the factors considered, which, like the established ranges, point to a greater subjective feeling of technostress in teachers from face-to-face universities. Results from the following subscales include: techno-anxiety [$t(236) = -2.749$, $p < 0.01$; $d = 0.62$], techno-fatigue [$t(236) = -3.016$, $p < 0.05$; $d = 0.82$], techno-skepticism [$t(236) = -3.984$, $p < 0.001$; $d = 0.87$], and techno-inefficacy [$t(236) = -3.799$, $p < 0.001$; $d = 0.70$].

Taking into account the gender of the participants, women held higher mean scores in the Salanova questionnaire, although these differences can only be considered significant when we examined the global mean score in the instrument [$t(235) = -2.524$, $p < 0.05$; $d = 0.38$]. This resulted in the following score: techno-fatigue [$t(235) = -2.558$, $p < 0.05$; $d = 0.63$] and techno-anxiety [$t(235) = -3.687$, $p < 0.01$; $d = 0.74$] (see **Table 7**).

TABLE 6 | Technostress (Salanova, 2003) levels according to the type of university and gender.

	Total	Online	Face-to-face	Men	Women
Techno-anxiety					
Very low	19.7	31.3	15.2	24.5	15.7
Low	8.4	10.4	7.6	8.2	7.9
Medium low	21	22.4	20.5	28.2	15
Medium high	18.9	16.4	19.9	15.5	22
High	16.4	4.5	21.1	17.3	15.7
Very high	15.5	14.9	15.8	6.4	23.6
Techno-fatigue					
Very low	20.2	31.3	15.8	22.7	18.1
Low	2.9	1.5	3.5	3.6	2.4
Medium low	15.1	13.4	15.8	17.3	12.6
Medium high	19.3	23.9	17.5	20	18.9
High	21.8	19.4	22.8	20.9	22.8
Very high	20.6	10.4	24.6	15.5	25.2
Techno-skepticism					
Muy bajo	29.8	46.3	23.4	30	29.9
Very low		0.0	0.0	0	0
Low	18.5	20.9	17.5	16.4	19.7
Medium low	18.1	14.9	19.3	20	16.5
Medium high	26.1	14.9	30.4	28.2	24.4
High	7.6	3.0	9.4	5.5	9.4
Techno-inefficacy					
Very low	25.2	41.8	18.7	28.2	22.8
Low					
Medium low	23.5	29.9	21.1	24.5	22
Medium high	21.4	17.9	22.8	20	22.8
High	21.4	4.5	28.1	20.9	22
Very high	8.4		9.4	60.4	10.2

TABLE 7 | Average scores obtained in the Salanova (2003) technostress questionnaire according to the type of university and gender.

	Total	Online	Face-to-face	Men	Women
Techno-anxiety	1.60	1.1604	1.7807	1.2136	1.9567
Techno-fatigue	2.24	1.6530	2.4751	1.9091	2.5433
Techno-skepticism	1.58	0.9565	1.8275	1.5159	1.6444
Techno-inefficacy	1.22	2.8756	2.7000	1.1055	1.3260
Total	1.88	1.4730	2.0399	1.6822	2.0595

As with the objective technostress questionnaire, the subjective sensation estimated in the Salanova questionnaire shows the older and with more years of experience teachers as those with the greatest symptoms of techno-anxiety, techno-fatigue, techno-skepticism, and techno-inefficacy (see **Table 8**).

Regarding job performance, statistically significant differences were observed, as in the previous questionnaires, depending on the type of university considered. This indicates that online university teachers were more likely to view technology as a tool to help them in their performance [3.8578 vs. 3.1715; $t(237) = 4.615$, $p < 0.001$; $d = 0.68$], compared to the face-to-face university teachers.

Similarly, older teachers ($r = -0.163$; $p < 0.05$) and those with more years of experience ($r = -0.172$; $p < 0.05$) felt that technology did not help them in their teaching role; thus, there were no differences in job performance when taking gender into account.

Correlation Analysis

The joint influence of both technostress measures (objective/subjective) was corroborated with the results obtained in the correlations between both instruments. In result, a joint influence of the objective and subjective measures of technostress was observed.

Wang and Li's (2019) objective technostress questionnaire and Salanova's (2003) subjective measure of technostress presented a statistically significant positive correlation ($r = 0.703$; $p < 0.001$) for the study sample. Taking into account the subfactors that comprise both scales, the misfit of teachers' abilities to the technological demands of the universities (ADT) provoked greater subjective sensations of technostress and, in particular, techno-fatigue ($r = 0.625$; $p < 0.001$), techno-anxiety ($r = 0.620$; $p < 0.001$), and techno-inefficacy ($r = 0.668$; $p < 0.001$) (see **Table 9**).

Proposed Technostress Models

The above significant correlations indicate a differential pattern in the type of technostress as well as how technostress, depending on the university, gender, age, and teaching experience, affects job performance during the period of confinement.

To examine in detail the relative weight of each of the variables considered, a SEM was used, where gender, age, years of experience, professional category, and the objective/subjective measures of technostress were considered as predictor variables of job performance.

The results show that the objective ($\beta = -34$) and subjective ($\beta = -16$) measures of technostress, as well as the teaching format of the university (online or face-to-face) ($\beta = -16$), served as explanatory variables of job performance. Given the provisional results obtained, two predictive models of job performance had been replicated, differentiating by the type of teaching methods (online or face-to-face).

Both models obtained goodness-of-fit indices which were considered good and supported the theoretical models used for this study (see **Table 10**).

For face-to-face university teachers, 22% of the explained variance in work performance could be explained through the technostress measures considered, with the same contribution for the objective variables ($\beta = -23$), rather than subjective ($\beta = -26$) variables of technostress (see **Figure 1**).

For online teachers, almost the same amount of variability in work performance was obtained as for teachers in the face-to-face modality (21%); in this case, the predictive weight focused exclusively on the objective measures of technostress was examined using the Wang and Li (2019) questionnaire ($\beta = -48$) (see **Figure 2**).

The very diverse context in which teaching functions are carried out by professors from both face-to-face and online universities makes it necessary to corroborate

TABLE 8 | Pearson correlations between Salanova (2003) technostress questionnaire and age and years of experience.

	Age	Years of experience	Total	Techno-fatigue	Techno-anxiety	Techno-inefficacy	Techno-skepticism
Age	1						
Years of experience	0.672**	1					
Total	0.138*	0.204**	1				
Techno-fatigue	0.113	0.150*	0.857**	1			
Techno-anxiety	0.146*	0.181**	0.895**	0.744**	1		
Techno-inefficacy	0.268**	0.259**	0.806**	0.572**	0.760**	1	
Techno-skepticism	0.254**	0.298**	0.757**	0.568**	0.603**	0.646**	1

*$p < 0.05$; **$p < 0.01$.

TABLE 9 | Pearson correlations between the technostress scales and subscales of the instruments used.

	Salanova, 2003	Wang and Li, 2019	SKE	FAT	ANS	INEF	ADO	NSO	ADT	NST	PPF
Salanova, 2003	1										
Wang and Li, 2019	0.703**	1									
ESC	0.757**	0.638**	1								
FAT	0.857**	0.604**	0.568**	1							
ANS	0.895**	0.629**	0.603**	0.744**	1						
INEF	0.806**	0.682**	0.646**	0.572**	0.760**	1					
ADO	0.610**	0.848**	0.544**	0.550**	0.571**	0.643**	1				
NSO	0.518**	0.844**	0.464**	0.438**	0.453**	0.469**	0.570**	1			
ADT	0.695**	0.904**	0.585**	0.625**	0.620**	0.668**	0.826**	0.677**	1		
NST	0.666**	0.895**	0.644**	0.548**	0.579**	0.639**	0.702**	0.732**	0.755**	1	
PPF	0.537**	0.817**	0.514**	0.437**	0.484**	0.517**	0.549**	0.666**	0.619**	0.688**	1

**$p < 0.01$.

whether the significant correlations remain between the subfactors, or if, on the contrary, there are variations that allow technostress to be characterized differently in both contexts.

For the general scales, the significant correlations between the objective technostress scale (Wang and Li, 2019) and the subjective technostress scale (Salanova, 2003) were maintained, yet, a greater intensity was shown for online university teachers ($r = 0.727$; $p < 0.001$) compared to face-to-face university teachers ($r = 0.674$; $p < 0.001$).

By analyzing the subscales of both instruments, there appeared to be differences in the sensation of technostress. In fact, teachers from the online universities showed a greater sense of techno-inefficacy when the demands of the organization exceeded the skills of its workers (ADO; $r = 0.668$; $p < 0.001$), when the university did not provide the necessary resources for teachers to carry out their functions (NSO; $r = 0.653$; $p < 0.001$), and when teachers did not have the necessary skills for the

established technological demands (ADT; $r = 0.728$; $p < 0.001$) (see **Table 11**).

In the case of face-to-face university teachers, more varied symptoms of technostress were observed depending on technological skills, organizational skills, and resources. In this aspect, teachers had a greater sense of techno-inefficacy when the demands of the institution exceeded the skills of their workers (ADO; $r = 0.607$; $p < 0.001$), when the university did not have the necessary technological resources (NST; $r = 0.616$; $p < 0.001$), or when teachers did not have the necessary skills for the established technological demands (ADT; $r = 0.618$; $p < 0.001$). The lack of technological ability of face-to-face teachers produced a feeling of techno-anxiety ($r = 0.612$; $p < 0.001$), techno-fatigue ($r = 0.638$; $p < 0.001$) and techno-inefficacy. This technological inability led to greater discomfort or subjective sensation of technostress among face-to-face teachers.

Lastly, it should be noted that when the university did not have the necessary technological resources to exercise teaching functions, higher scores for techno-skepticism ($r = 0.636$; $p < 0.001$) were observed among face-to-face teachers (see **Table 11**).

DISCUSSION

This research represents an advancement in the study of technostress for university teaching staff. A multidimensional analysis of the phenomenon was carried out in which personal variables (i.e., variables associated with objective and subjective

TABLE 10 | Goodness of fit indices of the proposed models.

	Online	Face-to-face
RMR	0.068	0.074
AGFI	0.989	0.988
GFI	0.993	0.993
NFI	0.990	0.989
RFI	0.986	0.985
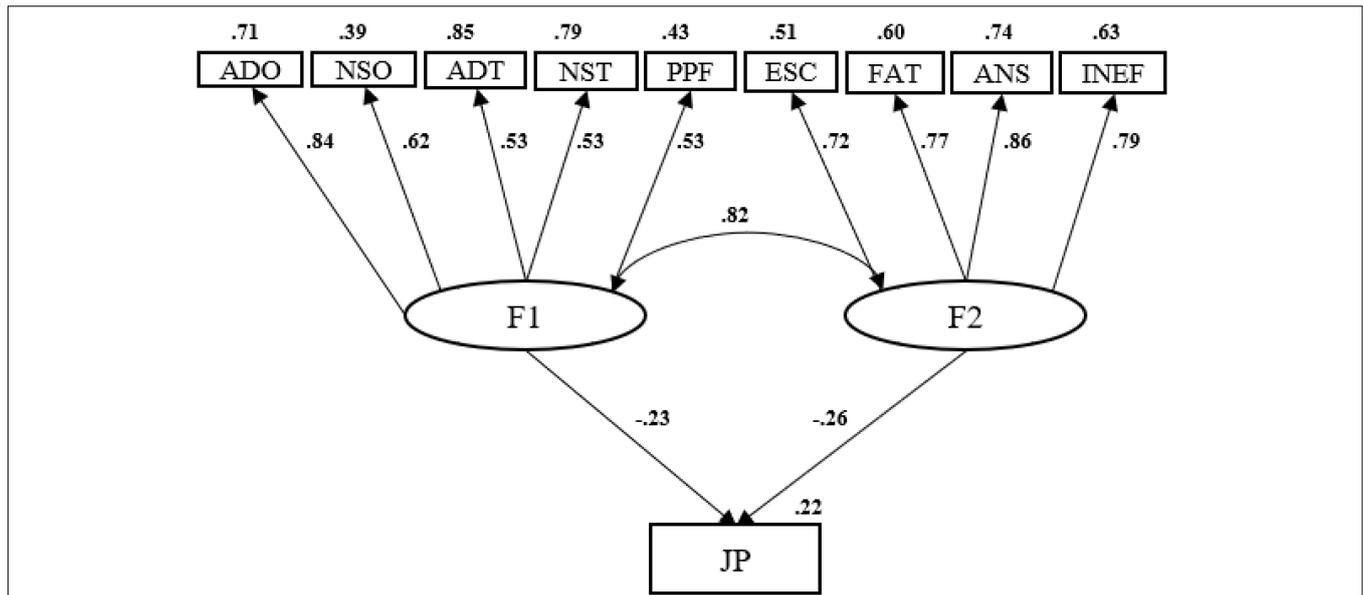
FIGURE 1 | Predictive model of the performance of face-to-face university teachers based on technostress.
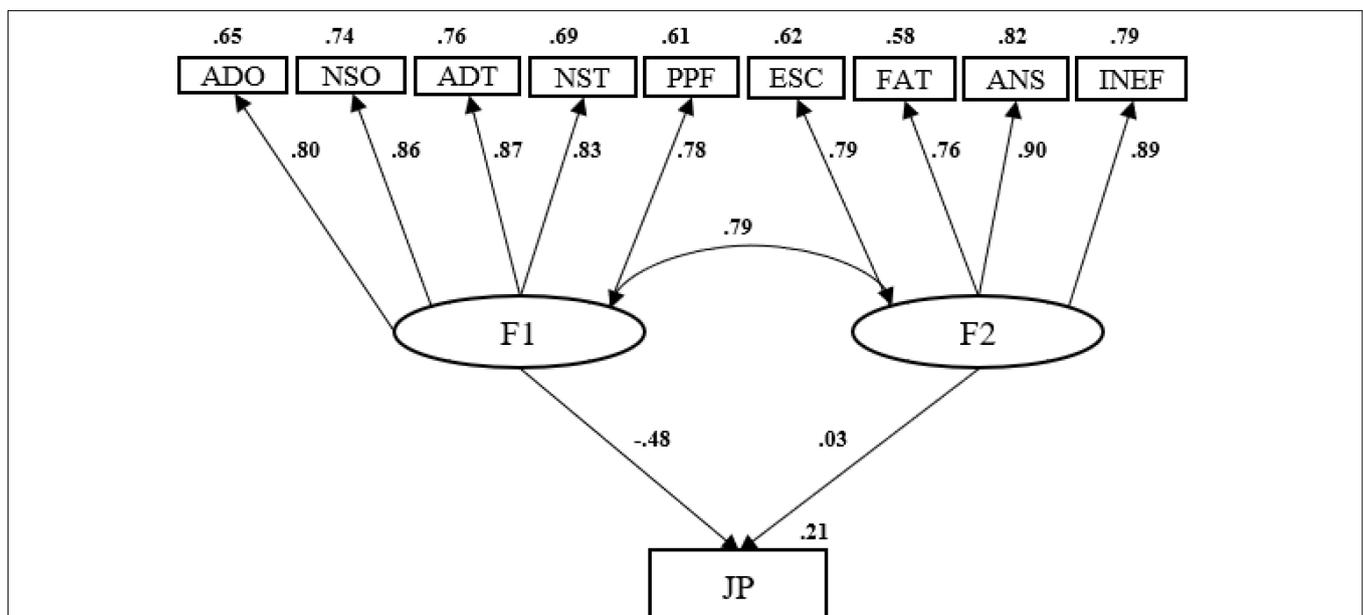
FIGURE 2 | Predictive model of the performance of online university teachers based on technostress.

technostress) and job performance were analyzed. In addition, it verified that the person-environment fit theory (P-E fit theory) developed by Wang and Li (2019) is maintained in the Spanish population.

This is the first study of technostress in university teaching staff to be carried out at a time of home confinement, when, for the first time, university education was forced to develop completely online, regardless of direct teacher-student contact.

The improvisation to which both teachers and students had to resort, subjected both groups to a level of stress that is not recommended for an adequate level of academic performance, as evidenced in this study and recent research on this topic (Li and Wang, 2020; Özgür, 2020; Penado Abilleira et al., 2020; Schildkamp et al., 2020; Wang et al., 2020). Hence, this study is interested in understanding which factors affect this situation the most. It has become clear how Spanish university teachers presented different levels of technostress when carrying out their teaching tasks during the period of confinement caused by the COVID-19 pandemic in Spain.

TABLE 11 | Pearson correlations between the technostress scales and subscales of the instruments used depending on the university: online (below) face-to-face (above).

	Salanova, 2003	Wang and Li, 2019	SKE	FAT	ANS	INEF	ADO	NSO	ADT	NST	PF
Salanova, 2003	1	0.674**	0.729**	0.857**	0.893**	0.772**	0.587**	0.431**	0.678**	0.647**	0.469**
Wang and Li, 2019	0.727**	1	0.605**	0.593**	0.603**	0.635**	0.842**	0.793**	0.883**	0.886**	0.779**
ESC	0.792**	0.607**	1	0.515**	0.563**	0.603**	0.520**	0.369**	0.549**	0.636**	0.462**
FAT	0.839**	0.563**	0.658**	1	0.743**	0.534**	0.557**	0.379**	0.638**	0.523**	0.372**
ANS	0.888**	0.666**	0.666**	0.713**	1	0.723**	0.539**	0.370**	0.612**	0.568**	0.425**
INEF	0.863**	0.731**	0.691**	0.613**	0.834**	1	0.607**	0.349**	0.616**	0.618**	0.462**
ADO	0.597**	0.860**	0.504**	0.446**	0.595**	0.668**	1	0.497**	0.799**	0.699**	0.511**
NSO	0.633**	0.885**	0.558**	0.481**	0.595**	0.653**	0.657**	1	0.603**	0.672**	0.567**
ADT	0.674**	0.911**	0.544**	0.500**	0.588**	0.728**	0.881**	0.699**	1	0.717**	0.549**
NST	0.641**	0.869**	0.537**	0.522**	0.539**	0.587**	0.627**	0.768**	0.745**	1	0.641**
PPF	0.602**	0.798**	0.487**	0.491**	0.559**	0.514**	0.510**	0.725**	0.585**	0.648**	1

**p < 0.01.

It was shown that older teachers and those with more years of experience (consequently holding the highest professional job categories), are those who have suffered negative consequences of technology to a greater extent during the confinement period. Contrary to what has been pointed out in other studies (Li and Wang, 2020), there appears to be an influence of gender on the level of technostress observed in university teachers, with women suffering more negative effects of technology compared to men. The influence of gender on technostress is consistent with other studies on student populations (Wang et al., 2020).

The weights of the objective variables or subjective feeling of technostress differed considerably between teachers based on the type of university (i.e., online or face-to-face). Nonetheless, the impact on job performance due to technostress was the same, with percentages of variability found to be close to identical.

Professors at online teaching universities pointed out objective aspects or difficulties in the technological resources provided by the organization in which they worked as the main difficulty in their work performance during the period of confinement caused by the COVID-19 pandemic. In this sense, the variables described in the Wang and Li (2019) questionnaire fully explain the performance problems of online teachers, with a total absence in the weight of variables or subjective feelings associated with technology.

In contrast, teachers from face-to-face universities had to make the greatest adaptations during confinement by incorporating technological platforms and resources that were formerly used less in their previous teaching environment.

The findings of this study show that the response of Spanish universities to the COVID-19 pandemic generated a lack of confidence in technology for online university teachers as well as a need to improve job performance. This decrease in job performance could be explained by objective aspects such as a lack of resources or instructions from their organization in order to carry out the new functions that they were expected to fulfill during the period of confinement. In the case of the face-to-face university teachers, a combined effect of objective aspects (e.g., lack of skills to comply with the instructions given by their university during the shift to online teaching or an absence of instructions), together with subjective feelings of techno-inefficacy, was observed.

The results obtained contrast with what has been established thus far by other authors which indicate that the employees of organizations with an environment characterized by high centralization and high innovation are the more likely to report a feeling of technostress (technostrain) in comparison with employees of less centralized and more innovative organizations (Wang et al., 2008). Based on these conclusions, it would be possible to expect that online teachers experience the effect of more subjective components of technostress, yet, the results obtained demonstrate the opposite.

It is necessary to incorporate measures that reduce stress associated with the use of technology in higher education. More specifically, these measures should be aimed at avoiding the consequences of technostress at an organizational level, such as absenteeism and reduced performance of technology users, especially due to the nonuse or misuse of technology in the workplace (Tu et al., 2005).

Educational authorities should aim to avoid an increase in workload due to the pressure to work faster or to work within more stringent schedules (Tarafdar et al., 2015). Additionally, educational authorities should aim to facilitate the education and training for face-to-face teachers in the use of various technologies (Graves and Karabayeva, 2020).

Due to the subjective feeling of technostress that teachers from face-to-face universities claim to suffer in comparison with their peers at online universities, various measures must be incorporated into face-to-face universities. Examples include actions that favor literacy facilitation, integration of technological and pedagogical knowledge until reaching the "knowledge of technological pedagogical content" (TPACK), and continuous teacher professional development (TPD) (Rienties et al., 2013; Özgür, 2020; Schildkamp et al., 2020). Technical support provision and involvement facilitation must also be added as strategies as these strategies have already been shown to inhibit technostress in university teachers in other populations (Li and Wang, 2020).

In the case of online teachers with experience in using technology, an intervention should be focused on informing or guiding them toward choosing the correct technology to carry out the entrusted task (Wang and Haggerty, 2011).

In both online and face-to-face institutions, training, rehearsal, a series of courses with special reference to less-skilled employees, teamwork, and sharing knowledge should always be available to employees to improve job performance and reduce the negative effect of techno-complexity (Al-Ansari and Alshare, 2019).

Finally, possible limitations of the obtained results should be pointed out. The most important limitation is related to the study sample, such that it would be convenient to expand the sample size in subsequent studies, as well as the length of data collection. The exceptionality of the situation experienced during confinement may have raised technostress. Therefore, it will be necessary to contrast these results with data obtained when the state of exceptionality generated by the COVID-19 pandemic disappears, and thus confirm the stability thereof.

It will also be necessary to triangulate the information through other analysis methodologies that provide a qualitative view of the phenomenon, using techniques such as interviews, observation, and discussion groups in order to allow a deeper understanding of the phenomenon. Likewise, it will be necessary to investigate more about the technostress associated with the different types of higher education that derive from the use of ICT (e.g., online teaching, blended learning, face-to-face teaching, e-learning, b-learning, teachings to distance, etc.), to further refine the stress-generating factors that can affect job performance for each type.

New forms of teaching and learning have been developed in recent years, and the circumstances arising from the current pandemic is accelerating the process. The social distancing regulations that have been imposed make it clear that face-to-face learning must adapt in order to remain competitive within the "post-pandemic reality." It is important to face the technological transition in the context of higher education with confidence while attempting to avoiding risks derived from the shift toward digitization.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Academic Stress and Emotional Well-Being in United States College Students Following Onset of the COVID-19 Pandemic

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COVID-19 has resulted in extraordinary disruptions to the higher education landscape. Here, we provide a brief report on 295 students' academic perceptions and emotional well-being in late May 2020. Students reported the high levels of uncertainty regarding their academic futures as well as significant levels of stress and difficulty coping with COVID-19 disruptions. These outcomes were related to the higher levels of neuroticism and an external locus of control. Female students reported worse emotional well-being compared to males, and the students of color reported the significantly higher levels of stress and uncertainty regarding their academic futures compared to White students. These results suggest that some students may be at particular risk for academic stress and poor emotional well-being due to the pandemic and highlight the urgent need for intervention and prevention strategies.

Keywords: college students, COVID-19, emotional well-being, higher education, pandemic, stress

INTRODUCTION

In response to the COVID-19 pandemic, over 1,000 colleges and universities in the United States closed their doors in March 2020. Millions of students were forced to finish the semester *via* remote learning, resulting in extraordinary disruptions to higher education in the United States (Goldstein, 2020). Although COVID-19 poses a low risk to the health and mortality of college-aged students (Centers for Disease Control and Prevention, 2020), the pandemic has likely resulted in stark uncertainty and distress in this population.

One particular area of concern for students in higher education is academic stress relating to their ability to succeed in this new environment. While enrollment in online courses has increased over the past several years, the majority of students remain unfamiliar with remote learning. A recent report indicates that prior to COVID-19, only 35% of United States college students had taken one or more courses online (D'Amato, 2020). This concerning given that one of the best predictors of academic success in an online format is prior online course experience (Hachey et al., 2012). This lack of experience may be compounded by challenging home conditions, including loss of access to academic resources (e.g., computers and internet connectivity) and distractions in the home learning environment. Indeed, the initial research shows that at-home distractions (including disruptions from other family members and additional responsibilities) are a significant challenge for college students learning from home during

COVID-19 (Son et al., 2020). Taken together, these factors are likely to lead to significant academic stress and uncertainty.

Aside from dealing with stressors related to a potentially unfamiliar online learning environment, students are also coping with the emotional impact of COVID-19. Much of the initial research on the mental health consequences of COVID-19 comes from areas hardest hit at the beginning of the pandemic including countries in Asia and Europe. This research shows that COVID-19 and its associated disruptions have resulted in significant increases in stress, anxiety, depression, and suicidality in college students (Husky et al., 2020; Li et al., 2020; Luo et al., 2020; Patsali et al., 2020). More recent investigations in the United States indicate that college students show a similar pattern in mental health and well-being to those from other regions of the world coping with COVID-19 (e.g., Luo et al., 2020; Son et al., 2020). Unfortunately, studies from the United States addressing these phenomena thus far have focused on students from single institutions and have under-explored gender and ethnic differences in COVID-19 related mental health issues. These are crucial to investigate, particularly because men and ethnic minorities are more likely to experience negative health outcomes after exposure to COVID-19 (Griffith, 2020), while women and ethnic minorities are more likely to suffer negative occupational and mental health consequences due to the pandemic (Adams-Prassl et al., 2020; Alonzi et al., 2020; NAACP, 2020). These differences are crucial to investigate, particularly, because the initial research suggests that women and ethnic minorities are more likely to suffer adverse changes in their emotional well-being due to the pandemic (Adams-Prassl et al., 2020; Alonzi et al., 2020; Rothman et al., 2020; Smith et al., 2020; Thibaut and van Wijngaarden-Cremers, 2020). For example, using a large, the geographically representative sample of United States adults, Adams-Prassl et al. (2020) documented a significant decrease in mental health as a result of initial COVID-19 stay-at-home orders. Of note, this decrease was entirely driven by worsening mental health in females. Similarly, research on ethnic minority populations suggests that the pandemic is likely to exacerbate pre-existing mental health disparities due to significant rates of COVID-19 infection in these communities as well as quarantine-related impediments to mental health care (Rothman et al., 2020; Smith et al., 2020). Thus, many students (women and minority populations in particular) are likely facing challenges to their well-being during the pandemic.

Emotional well-being during the times of turmoil depends on factors at both the individual and societal level. Thus far, research on emotional well-being during COVID-19 has focused on societal-level factors including response to situational stressors (e.g., infection fears, constraints on physical movement, limited social contact, and sudden lifestyle changes). What remains under-explored is how the effects of these stressors may vary based on individual differences such as personality traits. Neuroticism, for example, has profound implications for mental and physical health (e.g., Lahey, 2009; Widiger and Oltmanns, 2017). Research shows that individuals who are high in neuroticism are at increased risk for negative physical health outcomes and the various forms of psychopathology including

anxiety and mood disorders (see Tackett and Lahey, 2017 for a review). For example, a recent investigation in Germany found that individuals with higher neuroticism attended to and worried about the ongoing COVID-19 pandemic more than those lower on neuroticism (Kroencke et al., 2020). Additionally, locus of control (LoC) has been shown to predict the ability to cope with stressful life experiences (Zeidner, 1993; Lefcourt, 2013). During the SARS pandemic of 2003, having a more external LoC was associated with the development of PTSD following a SARS infection (Mak et al., 2010). Thus, it is likely that these individual differences also influence students' well-being during the COVID-19 pandemic.

The goals of the current study were 2-fold. First, in an effort to capture the impacts of COVID-19 on the higher-education landscape, we explored academic perceptions, emotional well-being, and individual differences among United States college students during the beginning stages of the pandemic in April and May 2020. As part of this exploration, we also assessed students' COVID-19 perceptions and behaviors and examined relationships between all variables of interest. Second, given that female and ethnic minority students are disproportionately likely to suffer negative occupational and mental health consequences related to the pandemic, we investigated gender and ethnic differences. In light of the recency of the pandemic, this study was exploratory and descriptive in nature. Such studies are a necessary first step toward understanding pandemic-related well-being and can inform later investigations that are more targeted and theory-driven.

MATERIALS AND METHODS

Procedure

A Qualtrics survey was distributed to students at the Arcadia University (Glenside, PA) *via* an online psychology major's community as well as through various department chairs. Outside of Arcadia, the link was distributed to psychology department chairs at institutions near Philadelphia, PA, including in OH, NJ, NY, DE, and Washington D.C. and was posted to an online teaching Listserv, so that members could distribute the survey link to their students at their own discretion. Participation was voluntary and not compensated.

The survey took ~10 min to complete. Multiple measures were administered; some of which were for another study and are not further reported here. Measures for this study were administered in the following order: demographics, questions assessing COVID-19 perceptions and behaviors, academic perceptions, locus of control, perceptions of stress within the past month, and neuroticism. The IRB at Arcadia University approved all procedures.

Participants

Three-hundred and 45 individuals started the survey. Two were removed for not meeting the inclusion criteria (full- or part-time undergraduate at least 18 years of age). Fifty participants were removed for incomplete data leaving a final sample of 295 participants (see **Table 1**). Eighty-five percent of respondents were

from colleges in the Northeast United States Notably, no student indicated that they had tested positive for COVID-19 (four did not answer), and 97% reported that no one in their immediate family had tested positive (four reported yes, and five did not answer).

Of note, these data were collected from mid-April to May 8, when the survey was made inactive. During this time much of the United States was undergoing extensive stay at home orders, in varying forms, generally allowing only essential businesses to remain open (Moreland, 2020). Additionally, at the time of data collection, wearing masks in public was not uniformly recommended and was therefore not assessed.

Measures
Academic Perceptions
Participants responded to three questions assessing academic concerns related to COVID-19: "To what extent do you think your academic future is at risk due to COVID-19?," "What is the likelihood that you would reduce (or withdraw) from your courses in the Fall of 2020 if classes were still completely or predominantly online due to COVID-19?," and "To what extent is distraction an issue in your current environment?" Additionally, participants rated their level of agreement with the statement, "Transitioning to a completely online education is the correct response for schools and universities to take in response to COVID-19."

Emotional Well-Being
Participants responded to a four-item Perceived Stress Scale (Cohen et al., 1983) to assess the degree to which individuals perceive events in their lives within the past month as stressful on a 1–5 scale, ranging from "never" to "very often" ($\alpha = 0.78$). Participants also responded to a single item, "Compared to those around you (e.g., family, friends, and co-workers), how well do you feel you are coping with disruptions in your life caused by COVID-19," on a 1–5 scale, ranging from "not well at all" to "extremely well."

TABLE 1 | Student self-reported demographics.

Demographics	
Factor	**Sample size (*n*)/% of total**
Gender	
Female	237/80.3
Male	51/17.3
Other	7/2.4
Ethnicity	
White	212/71.9
Hispanic/LatinX	30/10.2
Black	26/8.8
Other	14/4.7
Asian	12/4.1
Age	
18–20	168/56.9
21–23	102/34.7
24–26	10/3.5
27+	9/2.8

Personality
Participants responded to a nine-item brief LoC scale (Sapp and Harrod, 1993) to assess the extent to which individuals perceive control over their own lives and the events around them on a 1–5 scale, ranging from "strongly disagree" to "strongly agree." Higher scores indicate a more internal LoC ($\alpha = 79$). Participants also responded to an five-item Neuroticism subscale of the Big Five Inventory (John and Srivastava, 1999) to assess the extent to which a person is prone to worry and emotional instability on a 1–5 scale, ranging from "strongly disagree" to "strongly agree" ($\alpha = 0.84$).

COVID-19 Perceptions and Behaviors
Participants responded to three questions assessing COVID-19 perceptions and behaviors, adapted from Wise et al. (2020): "How serious do you believe COVID-19 is?," "How do you think you will be affected if you personally catch the virus?," and "How often are you completing risk management behaviors?"

RESULTS

Descriptives
Academic Perceptions and Emotional Well-Being
One-third of students (33%) felt their academic future was "very" or "extremely" at risk due to COVID-19 (**Figure 1A**), and 32% reported being "somewhat" or "extremely" likely to reduce or withdraw from classes in the Fall of 2020 if classes are completely or predominantly online (**Figure 1B**). Sixty percent reported that distraction was "very much" or "extremely" an issue in their current environment (**Figure 1C**). Nonetheless, 81% of students "agreed" or "strongly agreed" that transitioning to an online education in the spring of 2020 was the correct response to take (**Figure 1D**).

Regarding emotional well-being, 30% of students reported that they were coping "slightly well" or "not well at all" with COVID-19 disruptions (**Figure 1E**) and reported stress levels were significantly above the scale mid-point of 2.5 ($M = 3.39$, $SD = 0.77$, $t(286) = 19.46$, $p < 0.01$, $d = 1.16$; **Figure 1F**).

COVID-19 Perceptions and Behaviors
Regarding COVID-19, 86% of students characterized the virus as "very" or "extremely serious" (**Figure 2A**), and 62% reported they would be "very" or "extremely" affected if they were to catch the virus (**Figure 2B**). Nearly all students (95%) reported engaging in risk management behaviors either "most of the time" or "almost constantly" (**Figure 2C**).

Aim1: Correlational Analyses
We first sought to assess the relationship between personality variables (neuroticism; $M = 3.35$, SD = 0.77; LoC; $M = 3.46$, SD = 0.64), academic perceptions, and emotional well-being (see **Table 2**). Both neuroticism and LoC showed similar relationships with academic concerns. Specifically, the higher levels of neuroticism and a more external LoC were associated with perceptions of academic future being at greater risk,
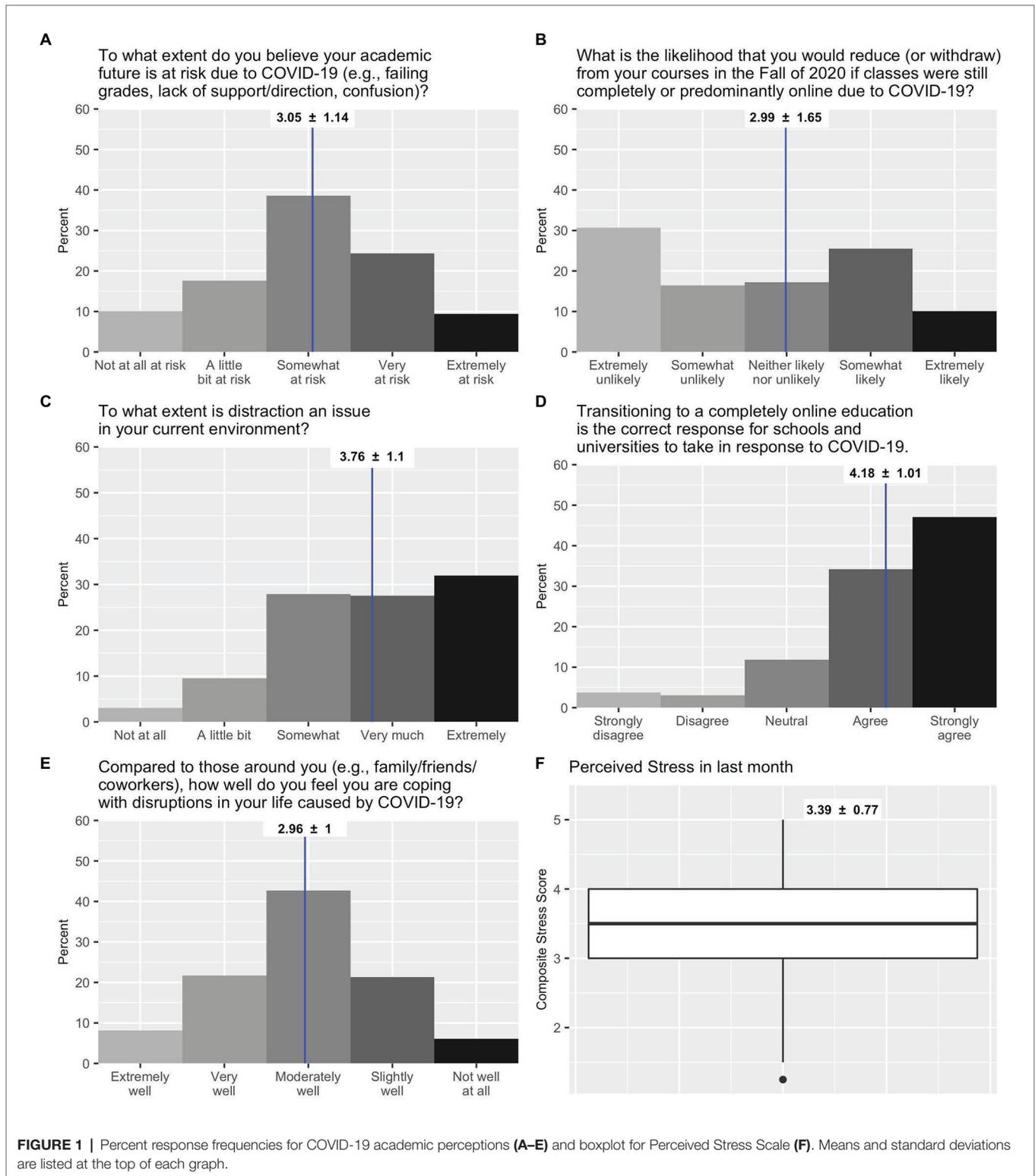
FIGURE 1 | Percent response frequencies for COVID-19 academic perceptions **(A–E)** and boxplot for Perceived Stress Scale **(F)**. Means and standard deviations are listed at the top of each graph.

higher likelihood of reducing or withdrawing from online courses in the fall, and the higher reported levels of distraction in the home learning environment. Agreement that the transition to online education was the "correct" response to the pandemic was not related to any personality variables

but was significantly related to lower risk perception for academic future, lower likelihood of reducing or withdrawing from online classes in the fall, lower levels of distraction in the home learning environment, and better coping with COVID-19 disruptions. Thus, students coping well with

FIGURE 2 | Percent response frequencies for questions related to COVID-19. Means and standard deviations are listed at the top of each graph.
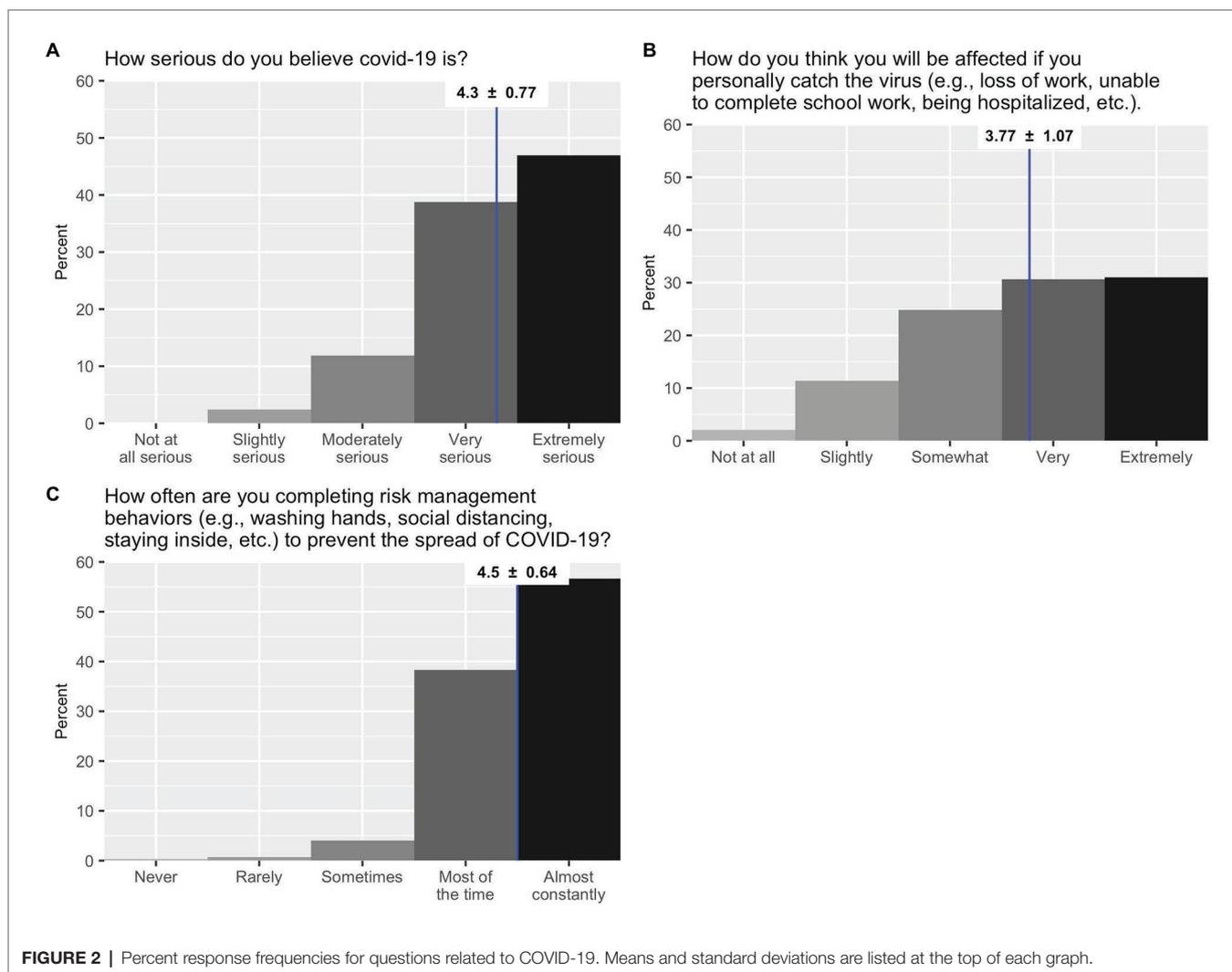
academic concerns and COVID-19 tended to agree that transitioning online was the correct choice.

Regarding emotional well-being, the higher levels of neuroticism and a more external LoC were associated with the higher levels of stress and worse coping. Academic concerns (variables 1–3) were also significantly related to poor emotional well-being (variables 5 and 6). For example, students reporting the higher levels of concern about their academic future reported higher stress and worse coping.

Lastly, we investigated whether students' COVID-19 perceptions and behaviors were related to their academic perceptions or emotional well-being. Though the perceptions of COVID-19 severity correlated with the degree to which students believed that they would be affected if they were to catch the virus, as well as their frequency of risk management behaviors, none of these COVID-19 questions were related to academic perceptions or emotional well-being (**Table 2**).

Aim2: Gender and Ethnic Differences
Our second aim was to investigate gender and ethnic differences in COVID-19 related academic perceptions and emotional

well-being (see **Table 3**). Females reported the significantly higher levels of distraction in their home learning environment compared to males; however, there were no other significant gender differences in academic perceptions. With regard to personality and emotional well-being, females had the higher levels of neuroticism, more perceived stress, and worse coping compared to males. Females also reported the higher levels of perceived COVID-19 severity as well as greater frequency of engaging in risk management behaviors.

Compared to White students, students of color (SoC: Black, Hispanic/Latinx, Asian, and Other) reported the perceptions of greater risk for their academic future and higher likelihood of reducing or withdrawing from online classes in the fall (although this difference was only marginally significant). Similarly, SoC reported that they would be more severely affected if they were to contract COVID-19 than White students. Somewhat unexpectedly, White students reported significantly more frequent engagement in risk management behaviors (e.g., washing hands) than SoC. There were no significant ethnic differences on stress, coping with COVID-19 disruptions, or either of the personality variables.

TABLE 2 | Bivariate correlations between academic perceptions, emotional well-being, personality measures, and COVID-19 perceptions and behaviors.

Abbreviated Variables	1	2	3	4	5	6	7	8	9	10
1. Academic: Belief future at risk[A]	-									
2. Academic: Likelihood reduce or withdraw[B]	0.3**	-								
3. Academic: Extent distraction an issue[C]	0.28**	0.25**	-							
4. Academic: Agree online transition correct choice[D]	−0.26**	−0.24**	−0.23**	-						
5. Emotional well-being: Stress[E]	0.51**	0.28**	0.37**	−0.12	-					
6. Emotional well-being: Coping	−0.31**	−0.19	−0.36**	0.28**	−0.56**	-				
7. Personality: Locus of Control	−0.29**	−0.16	−0.22**	0.15	−0.42**	0.33**	-			
8. Personality: Neuroticism	0.23**	0.19	0.25**		0.5**	−0.41**	−0.27**			
9. Perception: How serious is COVID-19[A]				0.14				0.12		
10. Perception: Degree affected if catch[B]	0.16		0.13		0.11	−0.14		0.11	0.27**	
11. Behavior: Freq. of Risk management[C]				0.14	0.11			0.15	0.23**	

$N = 280–295$. Variables A–F and A–C are shown in **Figures 1, 2**, respectively. Correlations within −0.1 and 0.1 are not shown. **Reflects significant correlations below the Bonferonni-corrected alpha ($p = 0.05/66 = 0.0009$).

TABLE 3 | Exploratory gender and ethnic differences.

	Male	Female			
Measure	M (SD)	M (SD)	t-value	p	Cohen's d
Academic: Extent distraction an issue	3.39 (1.18)	3.83 (1.07)	−2.57	0.01	0.39
Emotional well-being: Stress	3.03 (0.82)	3.45 (0.74)	−3.55	<0.01	0.54
Emotional well-being: Coping	3.31 (1.14)	2.90 (0.95)	2.42[A]	0.02	0.39
Personality: Neuroticism	2.86 (0.76)	3.44 (0.73)	−5.02	<0.01	0.78
Perception: How serious is COVID-19	4.02 (0.93)	4.35 (0.72)	−2.78	0.01	0.40
Behavior: Freq. of risk management	4.31 (0.65)	4.54 (0.64)	−2.33	0.02	0.36
	White	SoC			
Academic: Belief future at risk	2.95 (1.15)	3.31 (1.08)	−2.49	0.01	0.32
Academic: Likelihood reduce or withdraw	2.90 (1.71)	3.23 (1.46)	−1.65[A]	0.10	0.21
Behavior: Freq. of risk management	4.56 (0.55)	4.36 (0.82)	2.00[A]	0.05	0.29
Perception: Degree affected if catch	3.67 (1.07)	4.05 (1.04)	−2.77	<0.01	0.36

Only significant differences are shown. [A]Welch's t-test used due to the homogeneity of variance assumption being violated (Levene's test).

DISCUSSION

In an effort to contribute to documenting the effects of the COVID-19 crisis on the higher-education landscape, this study provides a snapshot of college student academic perceptions and emotional well-being at the end of May 2020. Roughly one-third of students perceived their academic future to be at high risk due to COVID-19. Similarly, about 30% of students indicated that they were likely to reduce or withdraw from classes in the Fall of 2020, should these classes be conducted online. Importantly, this study assessed students' perceptions, not actual academic decisions (e.g., the decision to enroll in classes). However, the initial reports, as of January 2021, indicate that undergraduate enrollment across all the types of higher education institutions is down about 4% from the previous year; a decline that is twice the rate from the previous Fall 2019 enrollment (National Student Clearinghouse Research Center, 2020).

Consistent with previous research on emotional well-being in college students during COVID-19 (e.g., Ma et al., 2020; Son et al., 2020), a significant proportion (about one-third) of students reported difficulty coping with COVID-19 related disruptions and the elevated levels of stress. Given research showing that college students are at particularly high risk for adverse mental health outcomes (Son et al., 2020),

this study demonstrates that these concerns likely persist and, in fact, may be exacerbated by the pandemic. Interestingly, students' emotional well-being was significantly related to academic perceptions but was unrelated to perceptions of COVID-19. Likewise, perceptions of COVID-19 were related to each other (e.g., perceptions of disease severity correlated with frequency of engaging in risk management behaviors) but were unrelated to academic perceptions. Thus, students are experiencing the high levels of stress, difficulty coping with COVID-19 disruptions, and have academic concerns specific to COVID-19, yet these variables were unrelated to their perceptions of COVID-19 itself.

These results above suggest that emotional well-being may have a stronger relationship with variables that have a more "immediate" impact on students' lives, rather than their overall perceptions of the disease itself. For example, academic performance or changes in the home environment (e.g., those imposed by social distancing/lockdown measures) may impact students' well-being or academic beliefs more than perceptions of the virus. Indeed, students coping well with COVID-19 disruptions (a measure assessing the immediate impact of COVID-19) were more likely to agree that the transition to an online teaching format was the correct choice.

Of note, none of the participants in this sample reported testing positive for COVID-19, and the vast majority (97%) reported that no immediate family member tested positive. Therefore, the relationship between disease perception and emotional well-being should be tested in a sample that has more direct experience with the virus (e.g., changes in stress and coping before and after a positive diagnosis of COVID-19). Likewise, this survey investigated coping with COVID-19 disruptions *via* a single-item in order to understand how students' perceptions of those disruptions impact their emotional well-being. It is important to acknowledge that students utilize different mechanisms for dealing with stress (coping strategies). For example, college women tend to use more emotion-focused coping strategies compared to college men (Brougham et al., 2009). Further, students' lifestyle habits and coping strategies can effectively mitigate stress, but not all strategies are equally effective and different races/genders utilize different strategies (Welle and Graf, 2011). Thus, future investigations would benefit from a deeper investigation of which coping strategies may be particularly effective for students during the COVID-19 pandemic.

In line with previous research (Gunthert et al., 1999; Mak et al., 2010; Roddenberry and Renk, 2010; Widiger and Oltmanns, 2017; Kroencke et al., 2020), higher neuroticism and a more external locus of control were related to greater academic concerns and worse emotional well-being. This suggests that some students may be particularly at risk for poor emotional well-being during the pandemic. Exploratory analyses revealed that females in our sample reported higher stress levels and worse coping with COVID-19 disruptions than males. This gender difference in emotional well-being could be partly explained by the higher levels of neuroticism seen in our female sample as is typical of research on gender differences in personality (e.g., McCrae and Terracciano, 2005). It is also possible that female students face unique stressors during the pandemic that contribute to poor emotional health. For example, female students may be more likely to take on additional domestic or caregiving responsibilities during quarantine compared to male students. This seems a likely possibility, as previous research shows that females are disproportionately likely to serve as caregivers for ill family members compared to males (Bott et al., 2017). Balancing caregiving responsibilities with academic work may place female students at particular risk for negative mental health outcomes during COVID-19. Future research should investigate the role of both neuroticism and additional responsibilities faced by female students on their mental health.

Alarmingly, the students of color reported the perceptions of greater risk for their academic future and the higher likelihood of reducing or withdrawing from online classes in the Fall of 2020. In fact, according to recent surveys by the National Student Clearing House, Fall 2020 enrollment for minority students is down 6–10% from the previous year's numbers (National Student Clearinghouse Research Center, 2020). This is in line with data showing that ethnic minority students are disproportionately likely to suffer negative educational consequences due to the pandemic (NAACP, 2020). These findings are particularly disconcerting, as they indicate that pre-existing inequalities in access to quality education are likely to continue to widen. Additionally, minority college students are more likely to rely on higher education institutions to meet basic needs, such as food and housing (NAACP, 2020), thus, withdrawal from classes during the pandemic has the potential to create problems beyond the interruption of education. Institutions of higher education should be cognizant of discrepancies in both academic and basic needs for minority students and work toward the implementation of interventions to support these students.

Though these data reveal several interesting relationships between academic perceptions, emotional well-being, and personality, they do not imply causation. The diversity of our sample (majority White and female) largely reflects the institution, where the survey was created and is not representative of all United States undergraduates. Additionally, our survey did not differentiate individuals from a socioeconomic perspective. It is likely that along with ethnicity, socio-economic inequities exacerbate pre-existing achievement gaps among students in higher education (Borman and Rachuba, 2001; Stephens et al., 2012). Indeed, it is possible that students' perceptions and risk behaviors regarding COVID-19 do impact their academic perceptions and emotional well-being, but the relationship is moderated by factors related to socio-economic status (e.g., reliable internet access). Given the cross-sectional nature of the current study and limitations addressed above, longitudinal studies are needed to assess the long-term impact on student academic perceptions and emotional well-being.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Arcadia University Institutional Review Board. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

AC, JD, and LF contributed significantly to the development, implementation, analysis, and subsequent reporting of this study. AC is the corresponding author (data available upon request). JD prepared all figures. LF assisted with editing and finalizing references. All authors contributed to the article and approved the submitted version.

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Australian Social Work Academics Respond to International Students in Crisis During COVID-19

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This article discusses the impact of COVID-19 on a cohort of international students studying at one Australian university and the efforts made by social work academics to assist these students through a challenging and distressing time between December 2019 and July 2020. International social work students usually rely on scholarships and casual employment to support themselves while studying. Nonetheless, the Australian government made no financial provisions for international students when the COVID-19 pandemic struck leaving many students without any means of support. Students from all parts of the world attend Griffith University, located in south-east Queensland, Australia, including students from Wuhan, China, where the first known outbreak of COVID-19 was identified. Shame, anxiety, racism and concerns related to the wellbeing of families overseas were superimposed onto their own health concerns and day-to-day survival while still seeking to maintain academic progress. Material and emotional support were provided through the establishment of a food bank and the development of a case management model to address the needs of students. A COVID-19 Alternative Placement course and a field education student hub supported academic success during the health emergency. These interventions developed independently as a crisis response and were merged into a multi-pronged, coordinated approach that included collaborations with other sections of the university and the community. A School working committee was established to co-ordinate interventions to address individual student need that included crisis intervention, referrals to internal and external resources, and developing communities of support. The journey traveled by students and academics and the lessons learned from this experience are described, all of which are relevant to future health emergencies including the value of involving social work in university preparedness planning. The article concludes that intensive support can enhance resilience while supporting students' own survival strategies, and, importantly, how such efforts can minimize, as far as possible, disruption to academic progress.

Keywords: international students, COVID-19, higher education, social work, Australia

Abbreviations: WHO, World Health Organization

INTRODUCTION

Australian Universities have undergone a series of transformations in the last sixty years moving from independence to corporate models of delivery dependent on ever-decreasing government funding and increasing student contributions. By the late 1980s, there was an increasing reliance on income from international students, who unlike domestic students pay full fees (Croucher et al., 2013). Between 2006 and 2019 the number of international students in Australia grew exponentially (167%) contributing AUD 38 billion to the Australian economy annually (Hurley, 2020a). Since the onset of the COVID-19 pandemic and subsequent border closures, international students living and studying in Australia dropped by 75,000 and on the March 25, 2020, there were 400,000 international students in the country (Hurley, 2020b). An even greater fall in the number of future applicants were expected.

In pre-pandemic conditions, international students were faced with a range of challenges including acclimatising quickly to a new culture and idiomatic language, new methods of learning, different working conditions and isolation from the usual social supports (Harrison and Ip, 2013). International students also faced discrimination, marginalisation and racism in many countries including Australia despite a national self-perception of egalitarianism (Lee, 2007; Brown and Jones 2013; Dovchin, 2020). These experiences leave emotional scars and generate strong feelings ranging from sadness to anger. It has been reported that international students tend to be essentialised and homogenised as passive with a focus on deficit rather than resilience and strengths which makes it difficult for students to openly express their practical and emotional needs (Ryan, 2011; Felton and Harrison, 2017; Tran and Vu, 2018).

However, this perception is changing, at least in the literature, attributing greater agency to international students and how institutions play a significant role in the exercise of agency as an interactive dynamic (Tran and Vu, 2018). While saying that, risks of psychological distress and a reluctance to seek formal assistance has been documented perhaps reinforced by the deficit perceptions of others as well as student experiences. This reluctance has also been attributed to saving face and reputation while cultural diversity has influenced how this is expressed (Forbes-Mewett, 2019). Other concerns relate to student access to physical and mental health care, safety and security, social support and the general cost of living including substandard living conditions (Arkoudis et al., 2019; King et al., 2020; Pejic, 2012; Briggs et al., Forthcoming). Yet, international students are diverse and resilient, bring skills with them and draw on a range of strengths.

According to Chen et al. (2020), the 5.3 billion international students globally who remained in host countries during the COVID-19 pandemic were particularly vulnerable to adverse effects particularly on their mental health. This article outlines the development of an innovative, co-ordinated, multi-pronged response to the COVID-19 induced crisis by social work academics at Griffith University which brought together various strategies that supported international students' own initiatives and coping with changed and uncertain circumstances. In consultation with Griffith University Human Research Ethics Committee, ethics approval was not required for the reporting of these initiatives.

THE AUSTRALIAN GOVERNMENT RESPONSE

A global pandemic has long been predicted (Doherty, 2013). The SARS-CoV-2 virus which causes the disease COVID-19 first came to world attention in December 2019 in Wuhan, China (Velavan and Myer, 2020). By March 11, 2020, a pandemic was declared by the World Health Organization (WHO, 2020), and the Australian government after a series of restrictions locked down the country at the end of March 2020. As early as January 2020, Haugen and Lehmann (2020) described how the higher education sector was concerned about unfolding events in China and the impact on the flow of international students. Although flights directly from China were stopped on the 1st February, 47,000 students from China entered Australia in the next seven weeks along with the many thousands from other countries. This precipitated the complex interplay of a number of challenges for new and existing students and universities. As the pandemic unfolded, a strong potential to negatively affect the wellbeing of international students and ultimately, their academic progression became clear. Closure of campuses during lockdown were particularly difficult for students around the world (Sahu, 2020).

In the midst of the pandemic in Australia, the Morrison government instigated the latest in a series of budget cuts to universities, notably proposing the doubling of fees for social work students while halving the fees of other allied health professionals (Fronek and Briggs, 2020). The proposal was ultimately overturned in October due to extensive lobbying which emphasized the value of social work, particularly in disaster conditions. International students usually in insecure work were excluded from the federal government's COVID-19 relief measures, Job Keeper and Job Seeker. This mirrored the early experience of international students in Canada, especially those from developing countries who were initially excluded from relief measures and suffered hardship as a result (Firang, 2020). International students in Canada suffered emotional distress, an impaired sense of self-worth, loss of interpersonal contacts and impaired academic performance (Firang, p. 2). However, attitudinal change meant Canada along with the United Kingdom, Ireland and New Zealand offered assistance to temporary visa holders including support packages for international students (Schleicher, 2020).

Rather than focusing on the pandemic itself and preserving health and life, the political blame game aimed at China for the COVID-19 pandemic risked Australia's reputation as a desirable study location, particularly for those students from China. Prime Minister Morrison's announcement on the April 3, 2020, suggesting that international students should "go home" was particularly distressing (Gibson and Moran, 2020). He strongly stated that international students were expected to have the

capacity to support themselves for twelve months ignoring the reality that many international students must work to do so (ABC News, 2020). An open letter was sent to Morrison about the plight of temporary migrants by 43 academics warning of the implications (Whiteford, 2020). By May 2020, 65% of temporary visa holders were unemployed and 23% had working hours reduced. Sixty-seven percent of the total were international students and the immediate consequences were food insecurity, loss of housing and a reliance on charity (Unions, 2020). These findings were supported by other studies (Defeyter et al., 2020; Morris et al., 2020; Noble et al., 2020). International students continued to be denied access to COVID-19 related benefits with no change to the government's position.

It is a myth that all international students have wealthy families who can support them as most, at least in social work, are reliant on scholarships and work to sustain international studies. Prior to COVID-19, food insecurity, insecure employment and housing were noted as long standing problems for students in the United States and Australia (Hughes et al., 2011; Silva et al., 2015). During the pandemic, insecure, casual employment was the first affected leaving many international students unable to pay their university fees while facing starvation and homelessness alongside concerns about the impact on their residency status (Cortis and Blaxland, 2020; Fronek and Briggs, 2020; Gallagher et al., 2020).

Similar to the UnitedStates and the United Kingdom, the COVID-19 pandemic provided an avenue for political opportunism in Australia which intensified underlying racism particularly toward people of Chinese appearance. A survey conducted by the Asian Australian Alliance found that the majority of reported incidents (35%) were racial slurs and name calling and 60% were physical and verbal threats including spitting and being coughed or sneezed at. The rest involved incidents such as being barred from restaurants or train stations and generally being excluded (Asian Australian Alliance and Osmond Chiu, 2020). Abuse (or at least its reporting) was also gendered with the majority of respondents being women. Traumatising experiences were accompanied by shame and fear resulting in adverse impacts on mental health and a sense of safety (Gallagher et al., 2020). The intersection of unemployment, food and housing insecurity, pre-existing challenges, racism and separation from families, along with contagion concerns placed considerable strain on mental health (King et al., 2020). A study conducted across three United Kingdom. universities found that food insecurity related to poor mental health and that, in turn, food insecurity related to living conditions (Deyfeter et al., 2020). The authors strongly recommended that these needs be met by policy makers and universities at multiple levels.

All these factors severely affected international students in the School of Human Services and Social Work at Griffith University. Social work academics and students took the initiative to respond to the practical and psychosocial needs created by these circumstances.

THE IMPACT OF COVID-19 ON GRIFFITH SOCIAL WORK STUDENTS

In the first trimester of 2020 (February-June), 55 of the 101 international students (62 in the Bachelor of Social Work and 39 in the Master of Social Work, qualifying) in the School of Human Services and Social Work were on field placement. Enrolled students were citizens of China, India, Sri Lanka, Pakistan, Vietnam, Cambodia, Nepal, Malaysia, Philippines, Singapore, Nigeria, Zimbabwe, Kenya, Sierra Leone, Chile, Ecuador, Peru, the United Kingdom. and Canada. The Bachelor of Social Work has an articulation program with Central China Normal University in Wuhan, and Griffith academics teach some classes in China every year. Prior to the COVID-19 pandemic, the School had established additional support mechanisms for students alongside university level initiatives. Two specialised roles in the social work program, the International Program Advisor who is Chinese and an International Field Education Convenor, were established several years earlier in recognition of the specific challenges international social work students face. Alongside the work of other social work academics, these roles were invaluable during the unfolding crisis.

With the exception of three students, all international social work students were able to return to Australia before border closures for the start of the trimester. While two Australian students on field placements overseas were brought home, one international student remained stranded in Sierra Leone, torn between family obligations and his studies and is now waiting for international borders to re-open. It was through specific academic programs and the observations of academics that the extent of the crisis became apparent. International students were found to be in acute distress. Many students had lost jobs, many families were only able to provide financial support for a short period or not at all, and students were without food, homeless or facing homelessness which affected their physical and mental health. Two early examples were students found to be living crowded into one room and a student who was found sleeping in the PhD study room and who had not eaten for some time. Students reported feelings of shame and for many, loneliness. Although grateful for the material and emotional support, these feelings were intensified by the need to rely on charity to survive.

Students were very aware of the Australian government discourse, policies and the social climate that evolved during the pandemic and acutely felt the negative impact of circulating discourses. Issues identified involved racism, housing insecurity, food insecurity, mental health and academic engagement. Experiences of racism were endemic in the community. For example, one Chinese student on placement in a high school was called "Corona" by the students. Conflation of the pandemic with Chinese people in conspiratorial misinformation spread on social media and the politicisation of the pandemic at the federal level of government added to a divisive social climate in some parts of the community and to episodes of racism. Another student from India reported that she was too frightened to leave her accommodation for several weeks for fear of racism and did indeed experience racism when she did venture into the community. She expressed how upset she was by the Prime

Minister Scott Morrison's comments which, in her view, incited discrimination and the "othering" of people from Asia. Chinese students, in particular, reported direct intimidation and threats based on their appearance.

Students were particularly concerned about their academic progress and their immigration status as the granting of student visas are dependent on the ability to support themselves while in the country. They shared stories about how difficult it was to study when living in overcrowded conditions. Mental health was affected by these factors with students reporting symptoms such as low mood, anxiety, sleep disturbance, loss of appetite, and of course, there were health concerns related to the deadly and highly contagious SARS-CoV-2 for themselves and their families in their home countries where struggles were exacerbated by health and political conditions. Students were also concerned about how their families were coping and their struggles to maintain some form of support for their children studying in Australia.

SOCIAL WORK INTERVENTIONS

Once distress was identified, a crisis response was initiated which included material, emotional and academic support delivered via a foodbank, a student field education hub and a social work health clinic (Gallagher et al., 2020). A case management model was developed, and communities of support and peer leadership roles emerged. A COVID-19 Alternative Placement course further supported academic success for those students on placements during lockdown and campus and agency closures. These interventions developed independently as crisis responses and were merged into a co-ordinated multi-pronged approach. This approach included collaborations with other sections of the university, external agencies and the establishment of a School Working Committee for the continued co-ordination of support through subsequent outbreaks and recovery periods. The health of all students was a priority and masks were distributed by the International Program Advisor and sanitiser was available through food bank donations.

Food Bank

One of the most pressing needs was food. Students from developing countries in Africa and Asia struggled the most. While they were fewer in number, many had fewer financial resources and limited networks with other students. As a group, they rallied together to share food and other resources.

The need for a foodbank was identified in early April 2020 when individual students were found squatting at the university without food. The first student that came to the notice of academics was given a food voucher provided by the School. Social work academics began donating food and a distribution centre was established via the Social Work Student Clinic with the assistance of social work students on placement in the clinic. The Lynne Richardson Community Centre, multi-cultural organisations and other community agencies (already struggling with local demand) and other individuals within the university contributed food and offered other types of assistance

to students. By the end of May, the local Scouts, Guides and other community groups donated food and students on placement at Gold Coast University Hospital facilitated food donations from hospital staff. Word circulated quickly amongst international students which generated more referrals from the Social Work clinic, the International Student Hub, academics in the School and students themselves. International students from other Schools (also in crisis) sought help from the food bank and collaborations were established with other sections of the university. With the onset of winter, some students also needed warmer clothes and blankets and were provided with donated items and vouchers to purchase what they needed.

Between the 22nd May and 21st July, a university level initiative distributed 2,380 meals to international students at two of the five campuses through Study Brisbane, FareShare, and Foodbank Australia Frozen Meals. Although the Scheme finished in early August 2020, food hampers with dry goods continued to be distributed through the International Student Advisory. The Gold Coast Hindu Multicultural Association donated meal vouchers for Indian students. As no food service was available at one of the two campuses that offers social work programs, social work students continued to seek assistance through the School.

Case Management Model

In response to emerging complexity, demand and the prolonged period of pandemic mitigation measures, the School developed a student-focused case management model to concentrate on immediate student needs, responsiveness, and the co-ordination and linking of services. The first task was to determine case manager responsibilities. As social work academics had the necessary expertise to fill the vacuum, they assumed the roles of case managers which demanded consideration of tensions such as balancing the dual roles of teaching while delivering a social work service. It was recognised that struggling students may not necessarily come forward themselves as some students that had accessed the food bank had not been proactive, instead they waited for an approach from the university.

The next task was to contact potentially affected students, devise assessment and develop interventions to meet individual needs. Using a series of general questions, a "mini-psychosocial assessment" was conducted to ascertain how a student was faring and to gauge if their basic needs were being met. The mini assessment asked five basic questions about how the student was faring with accommodation, food, financial support, coping ability and social supports. Many students were reluctant to provide detailed information about their financial situation as they were concerned about how this information would impact on their immigration status. By using the mini assessment to connect and explore issues, it was possible to ascertain when buying food was a problem, to identify students who had not eaten for several days or were in emotional distress while also allowing for further elaboration and more-in depth assessment where required. Ultimately, a total of 151 international students were contacted by phone or email. Forty (26.5%) were MSW (qualifying) students, 62 (41.1%) were in the BSW program and

17 (11.3%) were in other programs in the School. Another 32 (21.2%) students assisted were from other parts of the University.

With the assistance of students who assumed active leadership roles, social work academics who assumed the role of case managers provided a range of interventions linking students to available services. Resource lists compiled by students were distributed and links to services in the areas where each student lived were facilitated. Students referred for financial and housing support were assisted in negotiating these systems. Students continued to be referred to the foodbank which was stocked by donations. Twenty-three (15.2%) students who were case managed reported loss of employment and 8 (5.3%) had no income at all. University bursaries were offered to students who could prove financial hardship. Fifteen students (9.9%) who had applied were either turned down or the outcome was unknown.

Psychosocial support was provided by case managers and referrals for more intensive support were made to the student counseling service who offered virtual counseling sessions and to local service providers. In April, the Queensland state government made provision for international students to access mental health care (The Queensland Cabinet and Ministerial Directory, 2020). Eighteen (11.9%) of the international students reported mental health problems (low mood, anxiety, sleep disturbance, loss of appetite) consequential to income and housing loss, concerns about academic progress and the impact on their immigration status. Negotiating systems were also problematic for students who felt increasingly helpless and hopeless in the initial stages of the crisis.

Academic Support

On many levels, the inability to meet basic needs threatened the well-being of international students especially in relation to their academic progress and capacity to remain in Australia. Although alternative modes of study were developed for all students, intensive academic support was developed to support the specific needs of international students.

In pre-COVID conditions, international students were required to study the vast majority of their courses on campus which posed obvious problems with lockdown looming. While the Australian government did make concessions for international students during lockdown allowing them to study online, additional challenges associated with virtual learning and technology threatened to impact negatively on their studies adding to their precarious position. Only seven students reported having technical difficulties, no or inadequate internet connections and access to computers. Permission from the university was negotiated to allow individual students access to on campus computer laboratories during lockdown provided appropriate COVID-19 protective measures were in place. However, some students were reluctant to use the computer laboratories for virtual learning activities due to a lack of privacy as their courses required interaction with other online students and teachers.

Prior to COVID-19, the student hub model had been established to provide a mechanism that supported adjustments to new socio-cultural contexts and offered additional support to students struggling on first placements. Hub and spoke models are student focused placements that build learning communities which deliver sufficient support needed for student development particularly in relation to relieving anxiety and building confidence as students learn in safe and professionally supportive environments (Regehr et al., 2007; Roxburgh et al., 2012; Knight, 2013; Thomas and Westwood, 2016; McClimens and Brewster, 2017). In trimester 1, 2020, an aged care hub and spoke model established for international students coincided with the unfolding COVID-19 pandemic. The hub with five aged care organisations was extended to include students on placement at a disability service and a youth unemployment service. Relationships had been built with receptive agencies alongside intensive support from onsite supervisors, external social work supervisors and University Field Educators to maintain academic performance and to support students to attain field education competencies. Each student was matched with a domestic student for additional peer support. In addition to onsite formal and informal supervision, a weekly 3 h group supervision was co-facilitated by two field educators, a cis-man and a cis-woman. Mixed gender supervision was helpful in facilitating discussion.

Despite extensive support, student anxiety rose as the pandemic unfolded and Australia moved toward lockdown and agencies, particularly aged care, were closing. Students were prepared for the impending closure of agencies which began with a phone call from one student on the 10th March advising the immediate closure of the facility and her inability to continue placement. Within two to three weeks all aged care placements had folded, except for one. One student was required to quarantine at home for 14 days because her flat mates had returned from overseas and were in quarantine. During a group supervision the student advised that she had no food. A volunteer was arranged to leave groceries at her door. Some students took responsibility to maintain contact with her to ensure she had a continued food supply during the quarantine. During this time, the student became increasingly anxious about returning to placement due to concerns about contracting COVID-19 but benefitted from practical assistance and peer support. The model proved particularly beneficial during the pandemic as a sense of community and connectedness was established with the School and placement experience.

A COVID-19 Alternative Placement Course, established in two weeks as agencies closed, was developed as a virtual alternative using simulated learning and other strategies to ensure placement progression for all students including international students. Four placement options were developed Fully Integrated Placements, Partially Integrated Placements, Mixed New Placements, and new Research and Project placements. Fully Integrated Placements were in agencies that remained open and there was no change other than enhanced protective measures against infection such as working virtually or wearing masks, physical distancing and hand hygiene. In Partially Integrated Placements, students continued in agencies for two days and embarked on an agency related project for two days. Mixed new placements involved a two-day participation in the new COVID-19 Alternative Placement course and two days on a

placement related project, and Research and Project placements involved four days on a project. On the fifth day all students were required to complete a co-requisite course online. The course is currently being formally evaluated and early feedback suggests the course was useful in attaining field education competencies and was valued by students.

Students were commonly worried about using technology to connect with clients while those who remained in agencies that provided modified services were also concerned about whether they would be understood on the telephone and how they would be perceived. A high degree of distress and concern about working from home was expressed. Ongoing additional support through the hub was increased to three times per week with additional virtual group supervision, check-ins on Monday mornings, and a COVID-19 Recovery virtual tutorial on Wednesdays for 2 h. International students outside the hub, who were struggling with changed arrangements were invited to join the hub for additional support around specific challenges. Students on projects were able to present their work in these forums and three students created an interpersonal/counseling skills practice group that met weekly. The model enabled a structured, supportive response to vulnerable students and enabled students to mobilise their own resources, express agency and put the social work skills they were learning into action. Peer support enhanced student confidence in participating in group supervisions and the mix of domestic and international student led to the breaking down of barriers through continued social networks.

Student Leadership, Agency and Communities of Support

Throughout the pandemic and ongoing through the aftermath, students continued to play a key role in managing the social work food bank and identifying students in need. Students leaders emerged who took considerable responsibility for the well-being of other students and were supported by staff to be aware of their own needs for self-care and maintaining certain boundaries in order to do so.

With support, international students asserted their agency assuming responsibility to advocate for each other and provide peer support. Natural leaders emerged in this space alongside a domestic student on placement in the Lynne Richardson Community Centre, located near one of the university campuses, who worked with international student leaders and academic staff providing food for the foodbank and emergency relief. Another student in a student ambassador role assisted with other support and information about rental accommodation and access to counseling. Students continued volunteering activities, networking and applying for jobs (usually unsuccessfully) during this period. Generally, students took control of what they could in their lives, for example, self-managing daily expenses and other problem solving, meeting assignment deadlines and placement tasks and applying for extensions. They self-advocated and advocated for others on issues such as financial hardship and concerns about paying for tuition. Students also shared accommodation and transportation information and

recommended each other for part-time work. While students experiencing emotional distress also contacted counseling and mental health services, they reported that due to cultural differences the experience was not useful. Two resourceful MSW students in placement agencies that were closing due to COVID-19 negotiated alternative and appropriate work-based placements giving them the capacity to financially support themselves during the early stages of the pandemic.

It became apparent, that students from countries that had previously experienced epidemics and pandemics, such as SARS and H1N1 and other communicable diseases, were well versed in health measures and were better informed than many academics and other students whose only exposure was confusing health advice from government. At the onset of the pandemic, federal health advice was meted out in a painfully slow process prioritising economic concerns over health and lives before eventually introducing lockdown in late March. Universities, to a certain extent, relied on advice from governments. Many international students relied on their own knowledge of transmissible diseases and found it difficult to comprehend why mask-wearing and other measures were not widely adopted. This is not surprising given prior experience and clear advice being given in many of their home countries as well as the success these countries had in containing the COVID-19 pandemic during the first wave.

The School Working Committee in Support of International Students

On the 16th April, social work academics who had initiated and led the development of the food bank, case management, student hub and alternative placements developed from rapid responses to crises, came together in a co-ordinated, collegial approach forming the School Working Committee in Support of International Students. The working party still meets every two weeks to ensure the co-ordination of all parties actively working with international students continue to identify unmet needs and to ensure that no student would fall through the cracks. Student participation was considered, however, as confidential and personal information was likely to be discussed about particular student circumstances, students were not included on the committee in the interests of privacy, and confidentiality.

DISCUSSION

Fear, denial and uncertainty affected many members of the community whose own livelihood was threatened. Younger people have been particularly affected (Fronek and Briggs, 2020). However, international students were somewhat invisible to the wider community and unlike others in the community had no resources other than their own to fall back on. Decline in mental and physical health was consequential to not having their basic needs met. If temporary support had been offered to enable struggling students to maintain decent accommodation and to eat, mental health consequences would

have been lessened. Other countries recognised the plight of international students, however this did not happen in Australia. Instead the Australian Government, in contradiction to their focus on the economy and the significant contribution international students make to the Australian economy and to universities, left international students to fend for themselves in the midst of a global pandemic (Firang, 2020; Gibson and Moran, 2020). The full economic impact of pandemic is yet to unfold especially on universities. The government is planning to withdraw COVID-19 related benefits which means eligible Australians and businesses will return to pre-pandemic social welfare provisions. It is then the full impact on the economy and employment will be felt. Recovery is expected to be long and the opportunities for international students to return to non-exploitative employment quickly and what the "new normal" will look like for them are unknown. International students are important members of our community and should be supported as they are vital to the pathway out of this health emergency. (Hurley, 2020a).

The impact of lockdown, agency closures, job losses and food and housing insecurity on students heightened common experiences noted in the literature pre-pandemic (Morris et al., 2020; Noble et al., 2020; Unions, 2020). In other words, international students already "did it hard." The fallout from the pandemic heightened risks to health and well-being. The mental health of some social work students was severely affected related specifically to anxiety about their families, meeting their daily needs, isolation and managing the consequences of racism and exclusion. As noted in the international literature, isolation from families and social supports, discrimination, marginalisation and racism were significant challenges for international students prior to COVID-19 (Lee, 2007; Brown and Jones, 2013; Harrison and Ip, 2013; Dovchin, 2020). Having a culturally diverse academic team and early strategies in place did much to reduce isolation and feelings of hopelessness in a culturally sensitive way. The co-ordinated, multi-pronged approach became a necessity to ensure no student was missed and to meet complex needs in the absence of resources. The participation of domestic students was useful for their development as well as well as engaging in peer support for international students to reduce their isolation.

From this experience, there are lessons to be learned from the fortitude, coping, resilience and the sense of community demonstrated by international students during this health emergency. Their many skills including leadership came to the fore with just a modicum of support and assistance with material needs. Many international students come with experience of disease and disease management, were not strangers to hardship or trauma and have developed knowledge and skills as a result, although these same experiences leave them vulnerable. They did not expect to be in such a precarious situation while studying in Australia, especially given the sacrifices and costs associated with being able to further their education in a foreign country. It is important to shift our understandings about the reluctance of international students to seek help from a tendency to attribute this reluctance to individual students to encompassing an awareness of cultural

differences and those structural factors that deny their basic needs and create environments that are unsafe. The unifying goal for international students is to complete their education. Already acclimatising to new learning environments, different working conditions and isolation from their usual support systems, students had to adapt to virtual learning and practice and rapidly build new support networks (Harrison and Ip, 2013). Although a vulnerable group and universities responded quickly to the crisis, governments and the higher education sector, had failed to include international students in any form of disaster planning. Zoonotic disease is a common occurrence and combined with anthropogenic climate change and the sheer volume and rapid movement of people in a globalised world, a pandemic was inevitable (IPBES, 2020). COVID-19 will not be the last pandemic, nor will it be a one-hundred-year event if modern world problems are not addressed. This experience has taught us that it is essential to ensure international students are included in pandemic planning.

The social work profession has a strong role to play in disaster response in identifying and responding to community, social and psychological needs (Harms et al., 2020). The importance of social work knowledge to pandemic response is further emphasised given the uncertain and ongoing nature of a pandemic caused by a novel virus because it creates new conditions and vulnerabilities and possibly has even longer and globally significant impacts than other types of disasters. In this higher education example, social work academics were able to identify need and, more importantly, had the skills to respond rapidly in crisis situations and to establish longer term mechanisms that maximised the chances of international students achieving their academic goals while supporting material and psychosocial recovery. This was achieved over and above rapidly developing online curriculums, maintaining teaching and research activities, while also supporting domestic students struggling with the transition to virtual study. Given social work's expertise and skill set in disaster response, government and universities should include social work's expertise in pandemic preparedness. Australia is geographically advantaged and although the nation is faring better than many other countries and worse than some others, the challenges are not over for international students and "the new normal" is yet to be realised.

This article is a descriptive report on crisis-and-response-in-action. The interventions described were not empirically evaluated at the time of writing this article. Establishing the efficacy of the model would benefit from research on longer term outcomes. Three authors were directly involved in delivering case management and overseeing the foodbank. Two authors supervised and managed the placement hub. The first author, the Program Director, became involved at the School Co-ordination Committee level along with all authors and other School leaders. The second author, the Academic Lead of Field Education, oversaw all field education activities, rapidly developed the COVID-19 Alternative Placement course, and worked closely with Griffith International. Documentation taken throughout the crisis from the foodbank, case management notes, placement documentation, and School

Co-ordination Committee minutes, concerned individual students, assessments, interventions, follow up and student feedback. This documentation provided the sources of information about student circumstances and experiences, and the responses described in this article which partially addresses any potential bias in reporting and enhances trustworthiness of the information.

Strengths lie in innovation born in crisis which highlighted the social work knowledge and skills needed in identifying and responding to the needs of international students during the health emergency. Reflections on this period also highlighted areas for improvement such as introducing co-ordination at the outset to ensure earlier collaborative planning. The model developed may also be relevant to other countries where international students experienced crises during COVID-19.

In summary, the main findings concern the failure of governments and the consequential unmet need experienced which impacted disproportionally on international students, psychologically, socially and educationally. The exclusion of international students in government policy was short-sighted and caused unnecessary harm to the students described in this paper. The provision of psychosocial and material support enabled students to draw on their resources, develop agency and continue with their studies.

CONCLUSION

This article has considered the devasting consequences of the COVID-19 pandemic and government inaction on international students. Students throughout the world have suffered during this pandemic, however, international students have been greatly affected. After experiencing dramatic job losses, in a cruel, and very deliberate way, the Australian Government left these students with no viable means of support. They were virtually discarded and became homeless, hungry, discriminated against and displaced in a country that had previously welcomed them for the revenue they bring into the higher education system and the communities in which they live. The examples given here of the experiences endured by international social work students at Griffith are consistent with other studies reported in the

literature. While social work academics were able to develop a cohesive model of support, students were still left in increasingly tenuous circumstances, and the pandemic was not yet over at the time of writing this article. Overall, the experiences of international students during 2020 and beyond do not bode well for Australia's reputation. When international borders do eventually reopen, they may be less likely to recommend Australia as a welcoming place and study destination.

Recommendations

1. University disaster plans must include vulnerable student groups
2. Social work should be included in preparedness planning in relation to identifying and responding to student vulnerabilities
3. Further research is needed to evaluate innovations developed during the COVID-19 pandemic

The Australian government has a responsibility to address the failings described in this article which were better understood by other national governments that supported international students. Universities have a role in advocating for these changes.

AUTHOR CONTRIBUTIONS

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Re-thinking Public Health Education in Aotearoa New Zealand: Factory Model to Personalized Learning

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Key drivers of change in the 21st century—pandemic, technology advance, social disparity—are shaping the public health industry, including employment and education. In 2020, COVID-19 brought rapid change to the teaching of public health in higher education. In this reflective essay, we move beyond the delivery of existing curricula shifting from classroom to online, and consider the greater agenda of a transformative educational paradigm. This is broadly conceptualized as a shift from a "factory model education" to one of "personalized learning" with an emphasis on fostering creativity and heutagogical (student-driven) models, underpinned by technology, and real world application involving problem and project-based learning in a changing industry. Such change has stemmed both from the impact of COVID-19 on the education system, and in response to a more momentous transformation in public health careers and societal expectations of a public health workforce.

Keywords: workforce development, personalized learning, higher education, pedagogy, public health (MeSH [H02.403.720])

INTRODUCTION

The face of public health is changing in response to local and global trends of rapid technological development and worsening inequities (Mays et al., 2012; Dahlgren and Whitehead, 2015), both of which have been highlighted in the face of COVID-19 and prior global pandemics. Public health jobs reflect these shifts, emphasizing a need for greater collaboration and online projects, complex problem solving, and more fluid work patterns. Concurrently, education across the sector is in a process of transformation reflecting similar concerns to that of the public health industry. This change is paradigmatic and evolving, often conceptualized as one that is involves a move from that of factory model education to personalized learning.

Factory model education, described as originating in the industrialization era, is one in which students are grouped according to ability and taught the necessary skills, with an emphasis on predictable, standardized tasks, required to become successful workers (Levine, 2020; Moving Our Education System Forward, 2020). The model applies well to academia (Levine, 2020) where teachers typically deliver standardized lectures to large numbers of anonymized students, and standardized assessments are managed for large student populations through a Learning

Management System (LMS) (Levine, 2020; Moving Our Education System Forward, 2020). Globally, commentators have called for a transformation within higher education to adopt personalized learning, a concept coined by education psychologist Benjamin Bloom in 1984 (Asfa-Wossen, 2020; Levine, 2020). Personalized learning, also referred to as future learning and 21st century learning, empowers students by drawing upon their individual strengths, skills, and interests (Campbell et al., 2007; Asfa-Wossen, 2020; Levine, 2020). Such an approach emphasizes fostering creativity, promoting student-driven or heutagogical models, and accentuates real world application involving problem and project-based learning. Technology is increasingly the means to facilitate this transformation by a move away from standardization to a greater degree of customization and personalization (Campbell et al., 2007; Prain et al., 2013; Asfa-Wossen, 2020). It is no surprise then that evolving terms for the present into future include the digital age, the third-into-fourth industrial revolution, 21st century capitalism (Reich, 1992; Rifkin, 2015; Ross, 2016).

Pre-COVID-19, public health education in Aotearoa New Zealand, as with higher education locally and globally, relied mainly on analog ways of teaching and learning; that is, using "chalk and board" lecture and traditional assessment models, with a limited online, interactive presence. COVID-19 rapidly pushed higher education toward remote teaching and learning, involving difficult-to-imagine/or re-imagined pedagogy, at a time when organizations, professionals, and community understandings were not prepared for such a widespread change. However, whilst moving online has been a significant challenge, it has provided opportunities to extend the current paradigm and envision transformative change. Transformation, although difficult to achieve, as it requires development on several fronts simultaneously, must be at the fore of higher education advancement. For public health education, transformation involves changing how we respond as practitioners to significant global challenges such as pandemics; and how we respond as educationalists to the significant societal change brought about by the demands of the digital age (Bolstad et al., 2012; Gilbert, 2017; Robinson, 2020).

The public health team at Auckland University of Technology (AUT) is undertaking curriculum redesign to build an agile workforce, reflecting changing trends in higher education and public health in the 21st century. Public health at AUT is situated at a campus south of the city; in an area of Auckland that has a high proportion of Mâori and Pacific residents, giving rise to high numbers of Mâori and Pacific students enrolled in the program. Mâori and Pacific peoples experience inequity in morbidity and mortality in the face of influenza pandemics and other communicable disease (Jefferies et al., 2020). This context provides great opportunity for redesigning curricular that forefronts personalized learning, integrates indigenous and community perspectives driven by local public health solutions; as well as individual student choices and strengths. Such change is of significance, both nationally and internationally, in influencing the delivery of public health education to ensure it is responsive to community needs.

Currently AUT delivers undergraduate and postgraduate public and environmental health programs, including health promotion and disaster management. The teaching philosophy is underpinned by public health values of equity and social determinants (i.e., the economic, social, and physical conditions that influence health status), with an emphasis on the principles of the Treaty of Waitangi, the key national statement guiding policy and practice; supporting mâtauranga Mâori (Mâori values, principles, and knowledge) through utilizing Mâori health and well-being models. These include Te Whare Tapa Whâ, te Wheke, and te Pae Mâhutonga. All models encompass the importance of the health of people—their physical, mental, social health and wellbeing—and their natural environment (Ministry of Health/Manatû Hauora, 2002). While the program philosophy remains vital, the challenges to education are centered on delivery of content and what this will mean in a society where digital literacy is becoming a necessary skill to manage individual wellbeing as well as delivery of public health.

THE CHANGING FACE OF PUBLIC HEALTH

Throughout history, humanity has been plagued by disease and illness. The shift to agrarian communities followed by widespread trade, generated opportunities for human and animal interaction and marked a dramatic increase in the scale and spread of disease (LePan, 2020). Beginning with the Antonine Plague (165–180AD), other major outbreaks—epidemics and pandemics—have included the Black Death (1347–1351), Cholera outbreaks (1817–1923), Spanish Flu (1918–1919), and SARS (2002–2003). Within the last decade (2010-2020) there have been three notable outbreaks—Swine Flu (2009–2010); Ebola (2014–2016); MERS (2016-present); and currently, COVID-19 (LePan, 2020). Despite the continued occurrence of such outbreaks, improvements in public health systems (e.g., vaccination campaigns and improved sanitation), have resulted in a gradual reduction in overall death rates. However, preparing for and combatting epidemics and pandemics remains a significant public health issue. Indeed, the Centers for Disease Control and Prevention (2020) have posited that "stronger public health systems mean faster, smarter response to contain potential pandemics."

Reflective of the complexity in tackling a pandemic, over the past decades key movements in public health have employed a complex systems approach to design, implement, and evaluate interventions for change. Examples include New Public Health (Baum, 2008) and the World Health Organization (2008) Social Determinants of Health to Sustainable Development Goals (United Nations, 2020). These adopt an intersectoral and interdisciplinary focus on improving and protecting the environments in which people live and work, as well as the social conditions that contribute to health. However, while still highly relevant, these approaches are insufficient as a means of informing the future of public health as they inadequately address significant developments in the societal context.

New models of public health include precision population or public health alongside a personalized medicine revolution

and place greater emphasis on: precisely targeting population groups using big data; and individualized health consumption or empowered prosumer models of preventive health (Vogenberg et al., 2010; Mesko, 2015; Topol, 2015; Conn et al., 2017; Lyles et al., 2018). These models are technology based developments and are perceived as offering opportunities to be more responsive to the needs of individuals and communities. An example of this transformational change can be seen in the context of Aotearoa New Zealand where a serious public health concern is that of high prevalence of asthma and rheumatic fever linked to determinants of health such as poverty, unhealthy housing, and polluted neighborhoods. In the future, as a result of technology developments, addressing these issues could shift from broad population based interventions to a more precise and, indeed, potentially cost-effective population health approach where data from artificial intelligence (AI) are used to identify community patterns of poverty and ill health more specifically and provide information for policy action (Lyles et al., 2018). One element of a response might involve sensors and mapping technology to measure indicators of poor housing, such as damp, mold, and heat loss, offering opportunities to target resources accordingly (Lyles et al., 2018). Personalized medicine, integrated with a population based approach, will also contribute to public health solutions with technology offering opportunities for better individual health management; largely through smartphone technologies (Mesko, 2015; Topol, 2015). However, these changes mean that public health students, as future practitioners, will need high levels of digital literacy as well as skills that accommodate complex systems changes.

In relation to future employment the response to a changing society has resulted in a greater reliance on the internet and digital skills, and the ramping up of online work spaces with increased use of AI for tasks such as big data management, greater use of social media, social marketing, app design, and gamification. These changes broadly describe a shift from fixed career, lifelong white-collar work involving routine processing to portfolio careers whereby creative problem solving are combined with digitally enhanced cognitive and interpersonal skills (Reich, 1992; Rifkin, 2015; Ross, 2016). Increasingly, public health jobs are to be found in a variety of non-traditional spaces, such as social enterprises, "start-ups" and prosumer initiatives. These general trends fit well with inexorable trends in the 21st century public health industry (see **Table 1**).

Godin noted that empowered consumers are increasingly dismissive of traditional persuasion campaigning and demand a model where, as prosumers, they are engaged in debates and design, and have greater ownership and choice over the issue at hand (Godin, 2011). This personal portfolio revolution must be seen alongside governments having greater control over population health through big data and surveillance, which is a feature of precision population health (Lyles et al., 2018). Thus, pandemics, such as COVID-19, will necessarily demand increased intensive government involvement, requiring the training of a workforce able to implement the interventions needed at a population level; alongside other areas of public health (e.g., obesity management). This transformation will need to incorporate spaces and tools that are new to the public health

TABLE 1 | Digital age employment: the implications for public health jobs in the 21st century.

From	To
Brochure/TV campaigns, and face to face health education, limited data technology	Digital communications, social media, social marketing campaigns, apps, gamification, big data for precision population health
Government roles and fixed careers	NGOs, corporate interface, self-employment, portfolio careers
Interprofessional health teams	Post professional world, intersectoral teams
Health services in fixed institutions and locations	Social enterprise, prosumers, start-ups, projects funded from different sources
Health promotion with communities (e.g., healthy eating campaigns)	Personalized medicine (e.g., wearables and online service user interface) and empowered consumer/prosumer models (e.g., fitness and diet apps and platforms)
	Precision population health using big data to target initiatives more specifically to population groups
	Intersectoral public and environmental health (e.g., healthy cities and sustainable systems)

scene and involve new marketing techniques and information exchange such as that of the user-controlled YouTube model.

Thus, while face-to-face working with communities is still vital, taking on a mixed approach with that of online social marketing techniques, mirrors significant change in health promotion paradigms (Godin, 2011; Conn et al., 2017). Increasingly, consumers expect marketing to meet their preferences, including high budget digital marketing of consumer products and personalized content. As a result, public health and public health media campaigns, with limited budget and digital skill set struggle to have an impact. Digital upskilling is, therefore, essential to equip newly graduated public health workers to engage in jobs that continue to emerge and become normalized in e-health social media, chat spaces, empowered groups of users, app creation and use, health related "serious" gamification, as well as use of big data to tackle complex problems (Institute of Medicine, 2003; Lyles et al., 2018).

While school leavers who may be more prepared to engage with technology for the purpose of learning, job seeking, and employment constitute a large portion of the higher education system; the number of mature students, lifelong or continuous learners, continues to grow. Continuous learners (many of those choosing to study public health are already working in the health industry), want to work and study, they need flexibility and seek choice and relevance and are employment oriented (Susskind and Susskind, 2015; Gallagher, 2016). However, students in Aotearoa New Zealand currently seem to have limited awareness of the changes described in this essay, likely reflecting the struggle faced by society in keeping up with the rapid changes taking place, and how it should inform their choices. Indeed, what they should demand from universities. Students are, though, "voting with their feet" in relation to remote working, demanding more convenience from their study through online lectures and resources, as the pressures to combine work, study, and volunteering ramp up.

TRANSFORMING PUBLIC HEALTH EDUCATION

The call for root and branch change to curricula and delivery mechanisms across the education sector has been characterized as a shift from an industrial age "one size fits all" model (Levine, 2020; Moving Our Education System Forward, 2020; Robinson, 2020) to become that of 21st century learning systems which are fit for purpose. A key element of this call for transformative change is that the learner should be placed at the center of the educational system (Blaschke, 2012). This heutagogical paradigm differs from the more familiar teacher driven pedagogical paradigm of the learning experience being about the explication by a teacher to students on a given topic (see **Table 2**). Gilbert (2015) described this as "aboutism;" that is, education predominantly having a focus on imparting information on a given subject which is less about skills development and creative expression, project and problem-based study in real world settings, and where student preference is not considered central.

There appear to be strong synergies between these general concerns for higher education curricula and the specific circumstances of public health education. Public health scholars are now being asked to transform their skills from those of presenting a subject to being facilitators of student driven learning and choices, facilitating students finding out about a topic for themselves, having a range of new online and digital skills that fit with this new paradigm of education that promotes personal choice, and that is linked to real world scenarios. This poses a significant learning challenge for public health academics and points to a need for stronger links with industry in order to develop projects that facilitate student learning while being of benefit to the community.

The call for less "aboutism" (Gilbert, 2015) also highlights an issue: that of what public health content has traditionally been "about" and what it needs to transform to become. Globally, including in Aotearoa New Zealand, public health education has been dominated by biomedical and western health system norms (Trilling and Fadel, 2009; Coombe et al., 2020). Greater choice to explore subjects and paradigms allows for those which have been excluded, such as Mâori and Pacifica models of health and equity. Also, crucially, it allows students to choose or personalize curricula and assessment to their interest areas. In an interdisciplinary public health education, students from diverse backgrounds (e.g., ethnicity, age, gender, and personal interests) can shape the curricula and assessment to their preferences and evolving portfolios as well as to their context. This may include focusing on specific populations and their needs, as well as embracing multiple novel ways of developing strengths-based solutions.

Changes to curricula and delivery mechanisms to facilitate students in their efforts to prepare for the 21st century workplace have been documented to include: moving from a knowledge transfer paradigm to developing collaborative, communicative, cross-disciplinary skills which promote creativity and innovation (Trilling and Fadel, 2009). Further, there seems to be broad support for promoting digital literacy and use of e-learning, online, and blended learning to a greater extent. These general developments in educational delivery seem highly applicable to public health given the emphasis on greater choice, convenience, and cost-effectiveness for students. This needs to extend beyond delivery and curricular, to encompass the range of credentials available to students.

In 2017, the New Zealand Productivity Commission (2017) called for a radical transformation in higher education, suggesting that students be able to take individual courses and certificates which could be combined into qualifications, and which would come closer to meeting the needs of future employment. Given the increasing potential for portfolio careers, with less fixed roles and employment, and the need to keep up with technological change, international researchers have argued a flexible approach to credentials would support people to continuously upskill and stay current in order to meet the needs of their employers (Gallagher, 2016; Jorre de St Jorre and Oliver, 2018). Variously discussed as microcredits, nano degrees, badges and other new terminology (Gallagher, 2016), "micro-credentials enable learners to access specific knowledge and skills in a cost-effective and time-efficient way" (NZQA, 2018). This flexible approach to credentials would be ideal for public health which is applied and interdisciplinary and lends itself well to fitting with professional communities which could undertake study in short bursts at their own convenience. Indeed, the New Zealand Qualifications Authority have argued that such a "system will help ensure that the New Zealand education and training system remains relevant in a period of fast paced social, economic and technological changes" (NZQA, 2018).

In the changing climate of higher education, it is important that digital and technological change is driven by pedagogical change wherein technology reframes the types of student skills and attributes; thereby, moving beyond simply being a different method of delivering the same content. Despite some technological progress, it appears that truly transformative change within the university system is lacking. While a number of colleges have started to adopt micro-credentials, universities are seriously lagging in their response and implementation. There may be various reasons for this: bureaucratic structures wedded to old style compliance, slow rate of response, an emphasis on research over teaching, lack of student demand for change.

TABLE 2 | From factory model education to personalized learning: implications for public health education in the 21st century.

From	To
Lecture in the classroom	Collaborative groups, online projects, and industry engaged.
Standardized academic written English and numeracy skills	Digital literacy, multimedia communication skills, numeracy and data skills, serious games' design, personal preferences and abilities.
Standardized content and learning style	Individual portfolios, personalized learning, creativity, and innovation are central.
Standardized essays, exams, CV, and transcript	Greater industry engagement, individual and group creative problem-solving project assessments, internships and volunteering, digital portfolio includes multimedia assessment.

Further challenges faced by tertiary education globally were exposed by the disruption wrought by COVID-19 and include diminished resources and demand for improved infrastructure to support continued distance and blended learning models (World Bank Group Education, 2020). However, the public health industry is also lagging. The government funded health sector is similar in nature to higher education: it is not designed to manage rapid shifts, guidelines and competencies are outdated, and public sector jobs are few.

The slowness to change may be a reflection of traditional credentialing which was based on long-term knowledge exchange; whereas micro-credentialing is shorter and targeted, concerned more with creativity, new skills, and industry engagement. Delaying the shift to adopting micro-credentialing within higher education, however, may prove costly—socially and fiscally. At present, Aotearoa New Zealand students borrow significant amounts of money upfront to pay for a degree assuming that a relatively fixed pathway will enable them to pay off the loan and benefit from the education over their working life time. Yet, as organizations, jobs, and skills become more fluid, and society requires workers who can learn new skills throughout their working lives, this brings into question the upfront high cost of a 3 or 4 year degree. This is especially relevant for students from lower socio-economic backgrounds, such as that of south Auckland communities, who have less financial backing and for whom investment in education is a major sacrifice, and currently must be combined with work.

MOVING FORWARD

Building a stronger public health system is dependent on having professionals who are well educated and prepared to think creatively and adopt innovative practices. An example of this might be drawn from response to the current pandemic. Worldwide, an important public health message has been social distancing to curb COVID-19, and resulted in quarantine for travelers and governments limiting the movement of people. In Aotearoa New Zealand, people are now required to use an app on their phone to track their movements in public settings (Baker et al., 2020). Growing public awareness of this public health initiative required collaborative industry engagement to implement the initiative nationally, personalized medicine and prosumer models of education to empower people to take responsibility for their health, as well as digital communication to provide the knowledge and skills needed for using the tool. A challenge in the Aotearoa New Zealand context has been a sheer lack of public health workers and a poorly resourced public health system for managing the pandemic (Gorman and Horn, 2020; Pennington, 2020), forcing the government officials to rapidly train health workers and others for contact tracing and quarantine management. This example reflects the wider issue of the need to grow and develop the national public health system to respond to a range of future challenges (e.g., pandemics and waste water monitoring), and the need to develop public health workers able to perform in complex, intersectoral, and technology oriented environments.

Personalizing Learning

In the short to medium term, COVID-19 has brought to the fore, yet again, the need for the future of public health and higher education to be more collaborative, community driven and embracing of opportunities for new kinds of jobs, underpinned by new kinds of education. Such education, characterized widely as "personalized learning," would appear to be more attractive than the current standardized model, given the scope for individual choice and strengths base, the opportunities for personal and cultural expression, and for collaborative creativity. Indeed, a personalized learning model for public health education will offer greater relevance for public health students' future lives and work and be more relevant and valuable to the wider society. Generic changes to employment and higher education are highly relevant to public health, perhaps because this subject is so transdisciplinary and wide ranging, lending itself to major trends (e.g., digital focus, collaborative working, and creative problem solving); while offering a wide range of choices for students' preferences.

An Intersectoral Approach

Given the uncertainty of the future along with the legacy of slow organizational change, there needs to be an emphasis on partnership with the community and industry to create and nurture symbiotic relationships and to ensure future students and their families are part of, and aware of, the change conversation. This is particularly important when considering whether public health higher education is preparing people for employment in the long-term. Although dependent on widespread access to the internet and smartphones, alongside the skills and knowledge to utilize social media, apps and games, increasingly technology is being employed to help people meet health and wellbeing goals, with health practitioners to advise and support online (Mesko, 2015; Topol, 2015). Therefore, the promotion of digital literacy amongst individuals and communities; along with collaboration between organizations to ensure streamlined delivery of information is a high priority for higher education, particularly in the field of public health. In limiting classroom teaching, the COVID-19 pandemic has also challenged other aspects of higher education including networking and social content. "To remain relevant, universities will need to reinvent their learning environments so that digitalization expands and complements student-teacher and other relationships" (Schleicher, 2020, p. 4). With COVID-19 still presenting globally, and in anticipation of future pandemics, public health workers who have both interpersonal skills and are digitally literate will be an ongoing asset to society.

SUMMARY

Prior to COVID-19, public health higher education primarily consisted of classroom based learning, with some online lectures and standardized assessment. These methods fulfilled the criteria

of giving students much needed "knowledge;" however, the narrow approach was also reflected in graduates being trained to enter a workforce in which they were required to comply with standardized organizational processes that required them to learn how to "fit in." While these methods met the needs of the educational institution, the limitations of such a model are increasingly highlighted. COVID-19 has demanded a complete change to education delivery to encompass online methods; and it also offers opportunities for the move toward creative, personalized learning that emphasize student choice, personal identity, and strengths. The public health sector is becoming more diffuse and complex with many different players joining in an intersectoral approach that is defined by a digital era; such change demands a more responsive approach to higher education.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

CC: conceptualization and writing of public health and higher education. SN: writing and conceptualizing public health and higher education. MW: public health and higher education and mâtauranga Mâori. RC: public health and higher education and Pacifica learning. All authors contributed to the article and approved the submitted version.

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Learning Curves in COVID-19: Student Strategies in the 'new normal'?

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In New Zealand, similar to the rest of the world, the COVID-19 pandemic brought unprecedented disruption to higher education, with a rapid transition to mass online teaching. The 1st year (and 1st semester in particular) of any University degree presents unique challenges for students. Literature suggests these students have significant learning concerns as they adjust to University teaching and assessment requirements. These challenges may be exacerbated with the rapid introduction of online learning environments as they are increasingly disconnected from their peers, and, at a greater risk of struggling with web-based learning technologies.

This study investigated online learning strategies employed by 1st year students and examined the association between these strategies and student achievement. The University's learning management system (LMS; Blackboard) was used to collect deidentified data related to students' engagement with online content. The number of times content was clicked was recorded each day for the student's three courses. These data were collected over a nine-week period for all students ($N = 170$) enrolled in the 1st semester of their degree. This nine-week period spanned from the commencement of COVID-19 online learning to the week of final assessments. The relationship between assessment date and online engagement was investigated and linear mixed models were used to determine if engagement with online learning was associated with final course grades.

The results suggested that students adopted a learning strategy that coordinated their online LMS engagement with course assessment due date. Students had a 388% (SD 58%) greater specific engagement with the LMS on the assessment due date and the day prior, than throughout the remainder of their course. A further trend was observed whereby when an assessment was due in one course the students used an 'online bundle learning' strategy of increased engagement with the two other courses which has positive practical implications for the timing of uploading new teaching material. Finally, a clear relationship between the level of student LMS engagement and student course grade existed. For every additional week of zero LMS engagement, the odds of a student achieving. a grade lower than B were 1.67 times higher (95% CI 1.24, 2.26; $p < 0.001$), regardless of the course.

The rapid transition to online learning, as a consequence of COVID-19, has highlighted the risks of student disengagement, and the subsequent impact on lower student achievement across multiple courses. In addition, the authors investigated an 'online learning bundling' strategy that emerged; where students engaged more with a course when they were online submitting an assessment in a different course. These results emphasize the need for a university to implement greater cross-faculty coordination with reference to course design, uploading of information to LMS and timing of assessments. Improved coordination would provide a more effective online learning environment that maximizes student engagement and therefore achievement.

INTRODUCTION

The transition to higher education (HE) is often a complicated and difficult time for students (Kember, 2001). Many new HE students have moved directly from secondary education to HE and are not used to the typical HE environment. This is characterized by less structured class time per week, less direct contact with peers and teachers, and a greater expectation for independent learning. New HE students need to adjust quickly to these different styles of teaching and assessments, while adapting to the demands of a self-directed and independent approach to their academic work. Successfully adjusting to this increased level of independence in the first year is important, as it has a strong influence on total student effort and level of achievement, as well as increasing the likelihood of the student completing the whole course (Krause, 2001, 2005). Ultimately, it is each students' ability to adjust and engage in the HE environment that becomes a strong determinant of their level of engagement and achievement.

The HE environment has several non-academic factors that are related to student's success, time management, engagement and participation. Students must learn to cope with the new and often competing demands of the HE environment. For example, the juggle between work-life balance, and the peaks and troughs of workload. Research by Scherer et al. (2017) found that effective time management was a significant predictor of tertiary academic outcomes, as those with poor time management found it hard to plan and were often rushed at the end of a course or at assessment time. Literature highlights that in HE, there is a significantly positive relationship between students with who do manage their time effectively and academic performance (Khan et al. (2020)).

Snyder (1971) often referred to the concept of students understanding the 'hidden curriculum' (i.e., students knowing which key assessment points they need to attend and when, in order to achieve). This concept is important when trying to understand how students best strategize or allocate their attention and their time and has been discussed as a potential time-management issue (Miller and Parlett, 1974). However, the concept that is under-researched is the balance between strategic use of time and potentially a miss-management of time, especially for 1st year HE students.

The second non-academic factor associated with academic success is student engagement, which is defined as 'the quality of effort devoted to educationally purposeful activities that contribute directly to desired outcomes' (Chickering and Gamson, 1987). One way to consider engagement is that it is a gauge of the strength of the relationship between students and their HE institution. The HE institutions aim is to create an environment that affords learning to happen, but ultimately the final act of engagement lies with the student actions. Understanding and measuring student engagement in HE is a challenge, as it has multi-dimensional mechanisms, such as educational challenge, active learning, student-staff interaction, and support on campus, to name a few.

One weakness of traditionally measuring engagement in HE has been the lack of tools to objectively understand student engagement. The most commonly used tool is the National Survey of Student Engagement (NSSE) which relies on self-reporting survey data. However, 'active learning' (i.e., frequency of class participation; Carini et al., 2006) has been used in previous research to provide an understanding of HE engagement level. Traditionally, this has been recorded during face-to-face HE program delivered on-campus that typically feature content taught in a classroom at a prescribed time, and supplemented with prescribed readings and assessment (Broadbent, 2017). One of the more recent advancements in trying understanding student's interaction with the virtual environment in is the evolving area of HE is learning analytics (LA). In particular the use of large scale educational data about learners and their contexts. In this area, researchers have presented information about learners and their environment, with an attempt to provide models for future behavior (Ranjeeth et al., 2020). However, it appears that with advances in LA there is still little recorded improvement to student learning, or learning support for students (e.g., Viberg et al., 2018). This raises the question about how insights from LA can help facilitate the transfer into learning and teaching practices.

Understanding engagement in online HE learning environments has shown mixed results when compared to face-to-face measures. Research has shown that students that have chosen their University course specifically because it is online are likely to be have been attracted by the high level of flexibility and independence it offers (Bernard et al., 2004). They are confident they have the skills to excel, they enjoy the learning style and have the time management skills required to succeed in the online environment. Indeed, HE students have reported that time management and regular interaction with content and other students were the top skills needed to be successful with online learning (Roper, 2007).

The impact of COVID-19 led to a rapid transition for most HE institutions from face-to-face teaching to online learning environments. While a few HE institutions had online courses or blended courses in place, the majority were not prepared for this rapid change to online delivery and therefore had minimal time to re-design course delivery for this new environment. Unfortunately, there is a paucity of research examining engagement with online learning tools, particularly for those who, due to COVID-19, are suddenly forced to transition from a face-to-face to online environment which was not their initial learning style choice. Many HE institutions use Learning Management Systems (LMS) and this provides an opportunity to explore student engagement via their online learning behaviors. While there are many inter-related factors that influence student engagement, the authors have attempted to respond to the call from Viberg et al. (2018) of combing the science of learning analytics with pedagogical knowledge. Therefore, in order to better support student achievement and enhance the understanding of student engagement behaviors the aims of this study are to; (1) to understand the online learning strategy of 1st year HE students (forced) into an online environment, and (2) to examine how the strategy adopted influences student achievement.

MATERIALS AND METHODS

Participants

One hundred and seventy students who were enrolled in three courses as part of the first semester of their undergraduate degree participated in this study. As a response to COVID-19 these students, that were originally enrolled in face-to-face courses, were transferred to online delivery from week three.

Two courses had two assessment points across the semester; one mid-term assessment, and one assessment at the end of semester. While the third course had three assessments. For each course the structure included live online lectures, pre-recorded video content, and weekly online tutorials. The online delivery for the three courses was completed over nine-week period.

Online Engagement

Online engagement and activity was defined as the log data collected by the LMS, e.g., time spent or number of interactions students had with the LMS (Henrie et al., 2018). In this study online engagement was defined as the number of clicks per student recorded on the LMS. For each course online engagement data were extracted from the Blackboard Learning Management System using the in-built reporting feature. For each student, every time content was clicked (e.g., announcements, course materials, assessments) this information was recorded and stored within the LMS. While some engagement research uses log data of time spent logged into a page (e.g., Henrie et al., 2018), the authors found that this measure can give a false reading if a page was left open and not attended; thus giving the impression of a very long 'engagement' time with the LMS. Retrospective data covering the nine-week period were exported to an Excel spreadsheet, for each of the three courses separately. These data contained a daily breakdown of engagement information for each student (total number of clicks each day), for each of the three courses, across the nine-week period.

Student Achievement

Student achievement was measured using the final course grades that students received at the end of semester. The grading system ranged from 0 to 9, where 9 represented an 'A+' grade, 8 represented an 'A' grade, and 7 represented an 'A−'. The lowest passing grade is 1 which represented a 'C−', while a 0 was a failure to pass. The final course grade was calculated by averaging the mid-term and final assessment grades.

Analysis

In the first instance, student online engagement with each of the three courses were summarized using descriptive statistics (mean ± SD). The descriptive analysis was stratified by assessment days, non-assessment days, and the day prior to assessment day. The relationship between an assessment due date and change in online engagement in other courses was examined by calculating the difference between engagement on the due date and the days prior. These differences were presented as Cohen's D effect sizes with the following thresholds: 0.2 = small effect, 0.5 = medium effect, 0.8 = large effect (Cohen, 1988). All

achievement and engagement data was de-identified in order that appropriate ethical standards were maintained.

Lastly, generalized linear mixed models were used to examine if the level of engagement with online content was associated with final course grades. The final grades were dichotomized into 'B grade or higher' and 'Lower than a B grade' (B grade = 5), as this was the middle grade. This was treated as the outcome variable. Student engagement data was summarized for each student as the number of weeks throughout the nine-week period where students recorded no engagement with the online LMS. This variable, along with the course (three levels) were added as fixed effects, while each student was added as a random effect to account for the repeated measures. These models were specified with a binomial distribution and logit link function and were fit in R software (v 4.0.0) using the *lme4* package.

RESULTS

The results section present data to answer the two research aims; (1) To understand the 1st year student's online learning strategy and engagement and, (2) to examine how the strategy adopted influences student achievement.

The mean number of online interactions per day, along with the assessment dates for each course, is shown below in **Figure 1**. The spikes in student online engagement generally coincide with either the actual course assessment date (**Figure 1**, black vertical lines) or the uploading of key information related to an assessment onto the LMS (**Figure 1**, course 1(red) early June and course 2 (green) mid-May).

The values in **Table 1** represent student engagement strategy through the mean number of interactions with the LMS per student per day per course and course grades.

The strategy showed the use of a low level of mean daily engagement during the semester (i.e., 3.11–3.94) with relatively high levels of engagement when an assessment was due (i.e., 10.5–15.6). There was a large difference between engagement levels on assessment due dates and 'day-proceeding assessment due date' compared to non-assessment days. Student strategy led to 312 and 453% more online interactions when assessments were due. Interactions with the LMS were higher around assessment due dates, however, it is also worth noting that a small part of this increase was caused by students submitting assessment; i.e., on average 3–4 interactions per course to submit an assessment. It is worth noting that each week included online lectures, workshops, discussion boards and readings, so to have a daily use of only 2–3 interactions per day would be considered quite low in relation to the staff expectations of the course demands.

A key part of this study was to understand the learning curves of students in a COVID-19 environment and the link to achievement. It is important to consider the potential achievement implications for the students that adopted a 'low or no online engagement' strategy, as across the nine weeks of the three courses, approximately 34% (*n* = 53) of all students had two weeks of zero engagement with all of their three courses.
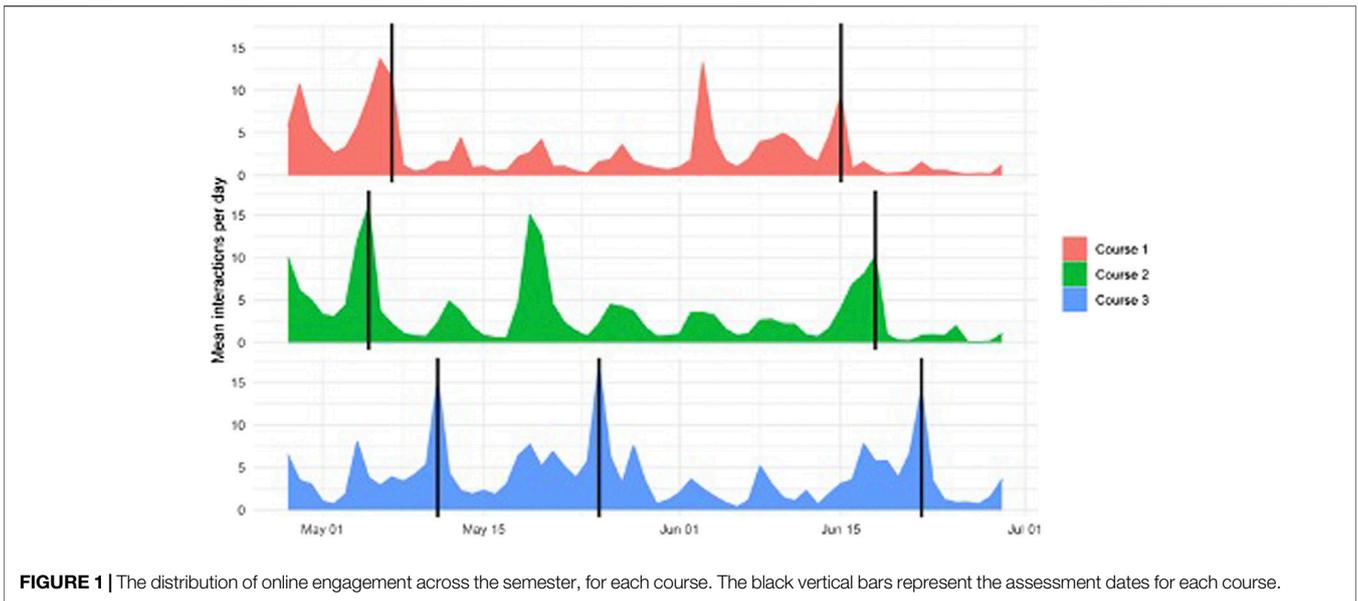
FIGURE 1 | The distribution of online engagement across the semester, for each course. The black vertical bars represent the assessment dates for each course.

TABLE 1 | LMS use on assessment and non-assessment days for 3 courses.

Variable (means)	Course 1	Course 2	Course 3
LMS use per day during the semester	3.11	3.46	3.94
LMS use on an assessment due date	10.5	12.9	15.6
LMS use on an assessment due date, plus day before	9.07	12.3	10.7
LMS use without assessment due date	2.88	3.26	3.57
LMS use without assessment day, plus day before	2.64	2.72	3.43
% Difference between assessment day plus day before and non-assessment days	398%	453%	312%
Number of students with a B grade or above	117	75	87
Number of students below a B grade	49	91	84

LMS = Learning management system.
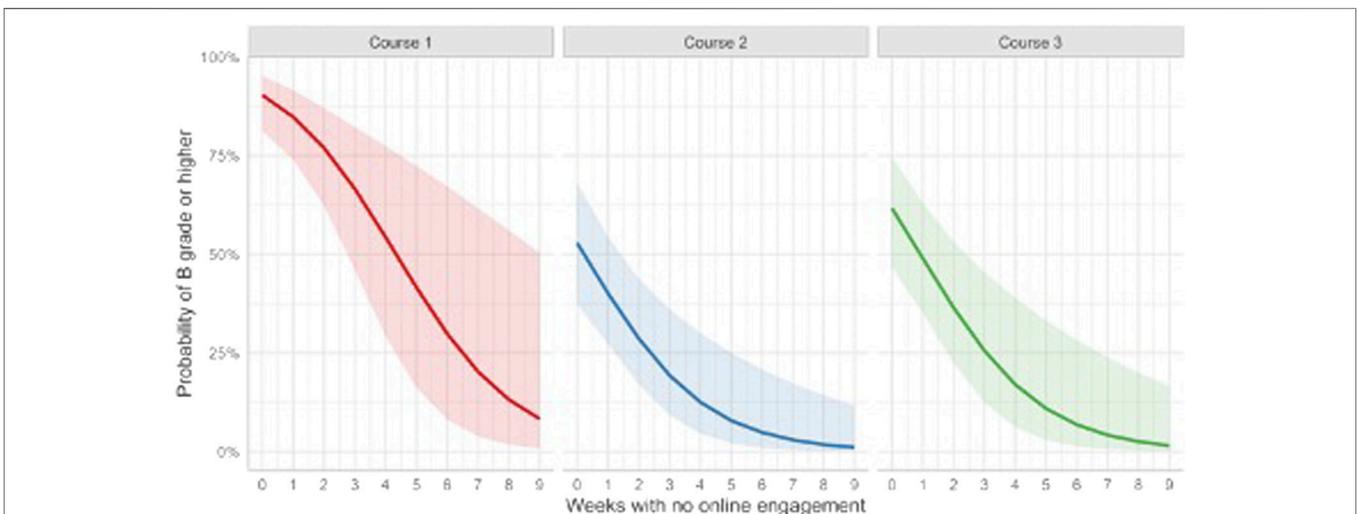
FIGURE 2 | Relationship between student achievement and the number of weeks with no online engagement. Estimates obtained from a generalized linear mixed model (binomial distribution, logit link). The shaded regions represent 95% confidence intervals.

TABLE 2 | Effect sizes difference of online engagement in one course, when an assessment is due in another.

	Course 1	Course 2	Course 3
Day 8	0.4	Assessment	−0.4
Day 10	Assessment	−0.1	0.2
Day 14	0.3	0.4	Assessment
Day 28	0.6	0.5	Assessment
Day 49	F. Assessment	0.4	0.2
Day 52		F. Assessment	−0.2
Day 56			F. Assessment

F. Assessment, final assessment, no other assessment due for that course.

The relationship between final course grades and the number of weeks with no online engagement is presented in **Figure 2** below. All three courses displayed a similar trend; as the number of weeks with no online engagement increased, the probability of achieving a B grade or higher significantly decreased. On average, for every additional week of no online engagement, the odds of achieving a B grade or better were 0.60 (95% CI 0.44, 0.81; $p < 0.001$), regardless of course. The inverse of this ratio can be interpreted as: the odds of achieving a grade lower than B are 1.67 times higher for every additional week of no online engagement.

The final data presented in this study explored learning curves of students online engagement during COVID-19 when an assessment was due in one of the three courses. **Table 2** below demonstrates the effect size differences between the online LMS engagement level in one course, coinciding with an assessment due in another course. This measure was determined by comparing the LMS values (mean and SD) on the day of assessment in one course to LMS values of the day before in another course. Findings showed that when an assessment was due in one course, for 80% of the time the students subsequent online engagement increased in one or both of the other two courses, despite those other two courses not having assessments due at that time. For the majority of the cases there were small to moderate effect size differences between an assessment due date and an increase in online engagement in the other courses. This strategy could be described as a 'bundling effect' of cross-course online engagement occurring due to assessment deadlines. The two exceptions to the 'bundling effect' were, (1) at the start of the semester, when online use was high across all courses as students were adjusting to a new online environment and (2) when an assessment in another course had occurred two days earlier.

DISCUSSION

This study aimed to understand the student learning curves of 1st semester, 1st year HE students in a COVID-19 enforced online environment, and the relationship with achievement. In order to explore these topical questions, a mixed method modeling was used of daily engagement data from the University LMS and end of semester grades. The clear result from this study has been gaining an understanding of the student engagement strategy and it's significant connection with the timing of assessments. Specifically, student online engagement displayed large peaks and troughs that correlated with assessment due dates. For many students, they had prolonged periods of little or no engagement with an online course, until close to an assessment due date. The 'heart-beat' graphic of **Figure 1** that represented the level of online engagement with the LMS during the 56 days of the course, and the assessment due dates for the 3 analyzed courses demonstrated a clear interrelatedness between student online engagement and assessment due dates. This strategy of selective interrelated behavior of 'when to engage' online can be in part explained by Snyder (1971) and Miller and Parlett (1974) research of the 'hidden curriculum'. 'Hidden curriculum' research demonstrated that students can be strategic about their use of time and energy in relation to course work and to assessment, and the study approaches in this paper supports this i.e., students spent more effort on tasks relating to assessment. What is uniquely demonstrated in **Figure 1**, is just how selective and strong the student behavior is toward assessment timing, but also worryingly the low levels of engagement between assessment dates, in particular the 53 students who had two weeks of no online engagement with their three courses.

Most HE literature links *sustained* effort and engagement to students' success. However, this is strategy has not been demonstrated by the students in this study, where students were forced (quickly) to move to the online learning style. **Figure 1**, highlighted student engagement was low between assessment due dates, and thus not sustained evenly over the course. **Table 1** also showed that the level of daily engagement on the day of and including the day before an assessment was due, was on average 388% (SD 58%) higher than the average of all the other days during the semester. These numbers clearly represent a learning curve strategy where students have focused their engagement with the LMS predominately toward assessment dates; consequently, creating a peaks and troughs approach. This strategy appears to be contrary to HE literature that demonstrates higher engagement, i.e., sustained, and more dedicate time to a subject, the more success a student has (Carini et al., 2006). Having high levels of engagement in learning, but also sustained effort has strong links to building the foundation of skills needed not only for success in HE, but also post HE (Kuh, 2003). In an online learning environment, where a lack of face-face interaction occurs, exceptional online engagement is needed in order to be successful (Bryson, 2014).

While one view of the results in **Table 1** and **Figure 1**, might support a selective approach to the use of time engaged with the LMS in relation to assessments: a contrasting view of potential concern, for these students in these trough periods. In this study, the authors investigated the peaks and troughs approach, to see if low levels of LMS engagement was a disadvantage for students. The results shown in **Figure 2** demonstrated that it was a disadvantage, and that for every additional week of no LMS engagement, the odds of achieving a grade lower than B were almost twice as high. This result unfortunately illustrated that students who implemented a strategy of no LMS engagement for a period, such as a week or more, had a strong negative impact on their final grade. This finding is in line with literature, which links sustained effort and engagement, to a student's success (Chickering, and Gamson, 1987), instead of a peaks and troughs engagement approach as highlighted in this study.

An unexpected result to arise from the analysis of LMS interactions with this research was presented in **Table 2**. Here the authors identified that the act of working on one course for a student assessment coincided with increasing engagement in one or both other courses. That is, when a student was online working on one course assessment, they also appeared to use that opportunity to bundle their LMS time and log on and to another course. This could be considered an 'online bundle learning' strategy. This strategy has been evidenced in other online environments, for example when the viewing or the sale of one product is bundled to that of another, in order to get greater sales and/or views (Jiang et al., 2018). The results in **Table 2** showed effect size differences and 'online bundle learning' occurred 80% of the time a student was online for a course with an assessment due, they also had increased levels of LMS engagement in one or both of their other courses. The implications for the HE course leaders is to recognize the positive engagement 'bundle' effect when they plan the time to upload new material to their online course so that the engagement of the students is maximised.

A concluding point from **Figure 1** is the impact on engagement of the timing of the final course assessments in relation to each other. While the timing of assessments is a challenge in HE, with multiple courses all needing to schedule assessments, having a short space between assessments due dates, may put substantiable pressure on students to complete these assessments. The timing of assessments is a key topic that students in HE cite as a major source of stress (Divaris, et al., 2008). The timing of assessments is an area where there needs to be greater cross faculty integration, to assist with student stress management and well-being (Divaris et al., 2008). Especially with 1st year students, where most courses are the same for students, there is the opportunity for faculty staff to work together and space the assessments more.

CONCLUSION

In summary, this research aimed to firstly understand the student learning strategy in the enforced COVID-19 environment and the

learning curves used by 1st year students. This large cohort of students was a particularly important group to understand, as the strategies developed in the 1st semester of a degree can have an impact on overall HE achievement (Khan et al.. (2020). This study revealed that during COVID-19 student online learning engagement followed a strong pattern of peaks and troughs, where their engagement was almost 400% greater when an assessment was due, compared to other times during the semester.

The second research question considered the influence of learning strategy on achievement. The results indicated that if students implemented a compounding none-engagement strategy with a course, then their grades significantly decrease. Success in HE is traditionally linked to sustained engagement, in a course of study, but the learning curves observed did not support this traditional strategy. An alternative 'online bundle learning' strategy emerged that occurred across multiple courses. Recognition of this 'bundle strategy' in cross faculty communication is an area that needs future investigation. Not only to improve the timing of assessments for students, but to also upload material online to all courses at a time when a student is likely to be submitting an assessment in another course as the student is likely to engage more with the uploaded material at this time.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

This article has been written by the four authors listed. The first two authors have contributed equally to this work and share the first authorship. The third and fourth authors were primarily focused on the data collection and analysis and editing, while the first two authors wrote the 1st draft and final edits.

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Professors' Expectations About Online Education and Its Relationship With Characteristics of University Entrance and Students' Academic Performance During the COVID-19 Pandemic

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Due to COVID-19, universities have been facing challenges in generating the best possible experience for students with online academic training programs. To analyze professors' expectations about online education and relate them to student academic performance during the COVID-19 pandemic, and considering the socio-demographic, entry, and prior university performance variables of students. A prospective longitudinal design was used to analyze the expectations of 546 professors (54.8% male) in T1. In T2, the impact of the expectations of 382 of these professors (57.6% men) was analyzed, who taught courses during the first semester to a total of 14,838 university students (44.6% men). Professors' expectations and their previous experience of online courses were obtained during T1, and the students' academic information was obtained in T2. A questionnaire examining the Expectations toward Virtual Education in Higher Education for Professors was used. 84.9% of the professors were considered to have moderate to high skills for online courses. Differences in expectations were found according to the professors' training level. The professors' self-efficacy for online education, institutional engagement, and academic planning had the highest scores. The expectations of professors did not directly change the academic performance of students; however, a moderating effect of professor's expectations was identified in the previous student academic performance relationship on their current academic performance.

Keywords: COVID-19, higher education, online teaching and learning, students experiences, university student

INTRODUCTION

Due to the COVID-19 pandemic, universities have been facing challenges in creating learning experiences for students using online academic training programs. This new training scenario has tested the adaptability, willingness, and flexibility of faculty members around the world (Quezada et al., 2020). Due to the consequences of the pandemic on teaching and learning processes at all

educational levels, there is an urgent need to understand how professors' expectations about online education, are linked to the learning processes and academic performance of their students, considering the changes produced by new forms of teaching and learning.

Theory on the expectations of professors, also known as the Pygmalion effect was presented by Rosenthal and Jacobson (1968), these authors demonstrated that student performance was influenced by teacher expectations. This finding was the beginning of several studies that observed the effect of teacher expectations on the academic performance of their students (Brandmiller et al., 2020). The expectations of professors are defined as the beliefs or assumptions that teachers make about the general levels of behavior and performance of students during their training process (Rubie-Davies et al., 2006). Professor's expectations are explained from a sequence of events such as the existence of stimuli that trigger the teacher's expectations. Then, these expectations are communicated to students and they change, which allows for the generation of behaviors that allow the student to adjust to these expectations impacting student outcomes (Rosenthal, 1994). These beliefs arise from the assessments that professors make based on the characteristics of the subject they teach, about each student, a particular group, or for the course in general (Barriga et al., 2019).

Research on professors' expectations has helped identify how they manage the complexities of the classroom to meet the diverse needs of students (Timmermans et al., 2018). The effects of professor's expectations impact their students through classroom interaction (Hornstra et al., 2018). Therefore, the prior beliefs of educators may influence their motivation to carry out the various instructional activities necessary for the development of the subject matter and affect the academic performance of the students. When professors present negative expectations about their students' performance, they can have a negative influence, especially, in the case of underachieving students (Madon et al., 1997; De Boer et al., 2018).

Professors' expectations about student performance that are systematically too high or too low compared to the students' actual performance level are called biased expectations (Timmermans et al., 2015). Professors may have biased expectations about the whole course or some students (De Boer et al., 2018). In this case, when teachers present diffuse expectations about performance, these may result in a self-fulfilling prophecy; that is, low expectations may hinder student learning, whereas high expectations may foster student learning and eventually lead to higher achievement gains (Gentrup et al., 2020).

A recent systematic review summarizes research published between 1989 and 2018 on the expectations of professors working at different educational levels. The results identify that educators' expectations for their students may be affected by demographic, social-psychological, behavioral, and classroom participation characteristics. However, the authors of this review caution that 30% of the selected studies, in their statistical analyses, did not have student academic performance controlled, making it difficult to establish whether low expectations for a group of students represented a biased professor's expectations

or actual reflections based on the students' performance (Wang et al., 2018).

Little research has been conducted in the field of higher education that addresses the issue of professors' expectations in this context (Li and Rubie-Davies, 2016, 2018; Timmermans et al., 2018). Qualitative research that analyzed 20 interviews with university professors reported that both student characteristics (prior academic performance, motivation, and study skills) and professors' characteristics (prior teaching-learning experience and professors' self-efficacy) should be considered influential factors in the formation of professors' expectations (Li and Rubie-Davies, 2018). Therefore, in the process of building professors' expectations, aspects of their students and that of the professors themselves may be involved.

The COVID-19 pandemic has increased anxiety and stress for university students due to the sudden switch from face-to-face teaching to an online learning system. This demands greater autonomy from young students, concentration, and adds concerns about their own physical and mental health, as well as that of their friends and family (Besser et al., 2020; Mseleku, 2020). Because of the pandemic and its consequences, the academic performance of college students has been affected by multiple students, professors, institutional factors, and connectivity-related issues (Adnan and Anwar, 2020; Demuyakor, 2020). For many students, this transition process has been negatively assessed (Garris and Fleck, 2020). A study analyzing the impact of COVID-19 in 30,383 university students in 62 countries indicated that students were primarily concerned about issues related to their future careers and studies, experienced boredom, anxiety, and frustration, and that connectivity difficulty and perceived increased workload prevented them from maintaining and improving their academic performance. Additionally, during the transition process to online education, over 53% of the students were satisfied with the support provided by professors and universities, mainly in Oceania, North America, and Europe (Aristovnik et al., 2020).

The positive evaluation of the students based on the actions of their professors highlights the importance of the relationship between them during this stage. In the COVID-19 scenario, students' perception of belonging and importance is related to high levels of adaptability, and regular opportunities to express their needs and to connect individually with their professors are beneficial for adaptation to this new context (Besser et al., 2020).

Due to the uncertainty of the COVID-19 pandemic, it is of interest to analyze professors' expectations about online education and evaluate its effects on academic performance by considering student characteristics, such as socio-demographic factors, college entrance, and pre-pandemic academic performance. In this regard, analyzing professors' expectations is an important area of research in educational psychology (Wang et al., 2018). This study seeks to provide support from a theoretical and practical point of view. From a theoretical perspective, it will contribute to the literature on the influence of expectations on student academic performance in a specific context of crisis, in addition to clarifying the role of prior academic performance within this relationship. This information will enable us to identify, from a practical point of

view, the most relevant expectations that predict student success throughout the semester, which can be useful in implement strategies for the continuous training of professors, in contexts where it is necessary to resort to forced virtual education. This study aimed to analyze professors' expectations about online education and relate them to the academic performance of students during the COVID-19 pandemic, considering the socio-demographic, university entrance, and previous university performance variables of the students.

Therefore, the following assumptions are made: first, we are interested in knowing if (H1) in the face of the COVID-19 pandemic, professors will have positive expectations about online education. Considering the theory of the Pygmalion effect on teacher expectations in university teachers with their students, with the aim examining the possible effects of expectations and their influence on student performance (De Boer et al., 2018). Our second hypothesis seeks to answer whether (H2) professors with previous experience of teaching online courses have higher expectations than inexperienced professors; concerning linking professor expectations to their students. This hypothesis arises from research that posits how different teacher characteristics such as background and beliefs, play a role in the construction of their expectations (Rubie-Davies, 2007; Garcia-Martin and Garcia-Sanchez, 2017; De Boer et al., 2018). In examining the links between teacher expectations and their students, (H3) a positive relationship is expected to be found between professor expectations and student performance during the COVID-19 pandemic, controlling for high school (GPA), college entrance exam (PSU) scores, and the prior career performance of students in higher education. Furthermore, these (H4) differences are expected to be found in the importance of the dimensions of professors' expectations in predicting student performance; and (H5) professors' expectations are expected to moderate the relationship between prior and current student academic performance. All of this is intended to provide data that seeks to answer whether teacher expectations are a true representation based on student performance (Wang et al., 2018).

MATERIALS AND METHODS

This study corresponds to a prospective longitudinal design. On a temporal level, it is a longitudinal panel investigation (Ato et al., 2013).

Participants

During the beginning of the first semester in 2020 (T1), all the professors of a university in the south of Chile were invited to participate in the study. We obtained information about expectations relating to online education during the COVID-19 pandemic from 546 professors (54.8% men and 45.2% women), with an average age of 46.41 years (SD = 11.3). At the end of the academic period (T2), 382 of these professors (57.6% men and 42.4% women) were identified as having taken courses during the first semester for a total of 14,838 university students (44.6% men and 55.4% women; age $M = 21.67$; SD = 2.73) from 95 careers.

Table 1 presents the distribution of students and professors participating in the study, considering the discipline of

TABLE 1 | Description of participating professors and students.

Discipline	Professors		Students
	T1	T2 (% about T1)(%)	
Natural Science	109	80 (73.4)	1.131
Agricultural Sciences	71	53 (74.6)	1.911
Medical and Health Sciences	127	47 (37.0)	3.109
Social Science	147	133 (90.5)	5.528
Humanities	39	28 (71.8)	328
Engineering and Technology	53	41 (77.4)	2.831
Total	546	382 (70)	14.838

knowledge of the faculty to which they belong. In general for all disciplines, between 71 and 77% of the professors took courses, except in the Medical and Health Sciences, where only 37% took courses during the first semester, and in the Social Sciences, where it was 90.5%. This difference was significant, $X^2(5) = 97.86$, $p < 0.001$.

Instruments

Expectations toward Virtual Education in Higher Education for Professors (CEEVES-D)

The questionnaire on Expectations toward Virtual Education in Higher Education for Professors (CEEVES-D) (Lobos-Peña et al., in preparation) was used to evaluate educators' expectations about online education. As well as measuring expectations about online education; the questionnaire design is self-reporting, and consists of 35 items distributed in nine dimensions, as described in **Table 2.**

Each item is answered on a five-point Likert scale, where one indicates "strongly disagree" and five indicates "strongly agree." The higher the score, the higher the professors' expectation of online education is considered high or positive, and scores below three indicate negative or low expectations. Reliability ranged from α = 0.79 to 0.95/ ωt = 0.74 to 0.96 for the dimensions and total scale.

Professors' Previous Experiences Teaching Online Courses

The responses were evaluated with oriented questions on the background of the participants' previous use of virtual classrooms, asking about their perception of ability and competence. Three question items were presented: *have you received training in teaching using virtual classrooms? (Virtual Campus, Canvas, other)*, to be answered with two options (Yes/No); as a professor, *have you developed courses using virtual classrooms? (0, 1, 2, or more)*, and *how do you evaluate your ability/competence to develop these courses? (0 = no ability to 3 = high ability)*.

Sociodemographic Characteristics of the Students and the Grade Point Average (GPA)

Gender, university entrance age, high school average grade, the score of university entrance exam (PSU), and type of origin

Name	Description	Cant. of Items
Institutional Engagement	Refers to the degree of support and resources that the university is expected to provide to the professors	7 ítems
Professors self-efficacy for online education	It shows the capacity to carry out pedagogical, evaluative and administrative processes in a platform	4 ítems
Interaction with students	Defined as expectations to achieve adequate communication and personal relationship with students.	4 ítems
Learning resources and activities	Considers the expected contributions of online activities and resources to the teaching/learning process	4 ítems
Academic planning	Defined as the expectations about communicating and developing the subject according to the planning	4 ítems
Teleworking in the context of crisis	It corresponds to the expectations of generating a space in the home suitable for developing online activities	4 ítems
Comparison with attendance	Defined as the degree to which the online experience will be better or worse than the traditional one in terms of performance, learning and teaching	3 ítems
Online evaluation	It refers to the ability of virtual environments to generate safe assessments that support the teaching/learning process	3 ítems
Monitoring of learning	Related to the ability to follow the learning that the students are doing in the subject	2 ítems

institution were considered as characteristics of the students' university entrance variable. The grade point average (GPA) in the first semester of 2020 and the previous years was obtained from the academic record of the university and considered as the students' academic performance.

Procedure

This research was endorsed by the Ethics Committee of the participating university, corroborating the ethical criteria for research with human beings. The university entrance data of the students was obtained in March 2020 from the official information registration platforms of the university. The application of the instrument of expectations of professors and their previous experience in online courses was carried out in digital format after obtaining their informed consent, during April 2020, corresponding to the month of the beginning of the academic period, in a virtual format. Finally, the academic performance of the students was obtained at the end of the first academic semester from the LMS CANVAS platform (September 2020).

Analysis Plan

All analyses were performed using R version 3.6. Using the information available in the first application, the expectations were analyzed using descriptive statistics. In addition, the relationship between previous experience and the set of expectations was analyzed using a non-parametric multivariate ANOVA test based on 1,000 permutations.

To study the relationship between professors' expectations and student performance in each class, a mixed linear effects model was used, using the information available in T2. As student control variables, gender, age, type of school of origin, and the quadratic effects of high school, entrance scores on the Language Arts and Mathematics test (PSU), and grade point average in the previous semesters in the career since 2015 (university grades) were considered. As control variables of the professors, we used their sex, knowledge discipline, workday, and previous experience in virtual platforms. Regarding the

expectations variables, the nine dimensions of the CEEVES-D instrument were considered. To account for the dependence of the data on each other, the Faculty where the student, subject, and professors belonged were considered as random effects. Career was not considered as a random effect, since the variance explained in the different models was very close to 0 and generated estimation errors. To study the difference between various mixed linear models, the likelihood ratio test was used. To evaluate the degree of adjustment between different linear models, the pseudo-R^2 indicator of Nakagawa and Schielzeth (2013) was used, which allows the evaluation of the level of adjustment to the total variance of the dependent variable as well as the variance explained for each random effect.

RESULTS

To analyze professors' expectations about online education and relate them to students' academic performance during the COVID-19 pandemic, considering the socio-demographic factors, university entrance, and previous student performance, the results were organized in two sections. First, the results related to university professors' expectations about online education and their relationship with their previous experience were presented; and second, results regarding the link between professors' expectations with the socio-demographic and academic characteristics of their students during the COVID-19 pandemic were presented.

Professors' Expectations and Previous Experience With Online Education

Table 3 describes the results of the descriptive form of professor's expectations for online education during the COVID-19 pandemic. For all dimensions except the dimension of comparison with attendance, they show averages statistically different from three, which allows us to indicate a positive or negative directionality for each of these. According to the results, it can be affirmed that the dimension of teaching self-efficacy for online education, followed by the dimension of institutional

TABLE 3 | Descriptive statistics of CEEVES-D dimensions.

Dimension	Descriptives				Test for $\mu \neq 3$	
	M	**SD**	**Min**	**Max**	**t (545)**	**p-value**
Institutional engagement	3.73	0.68	1.43	5.00	25.1	< 0.001
Professors self-efficacy for online education	4.13	0.61	1.00	5.00	43.4	< 0.001
Interaction with students	2.87	0.96	1.00	5.00	3.2	0.001
Learning resources and activities	4.02	0.66	1.00	5.00	36.3	< 0.001
Academic planning	3.84	0.68	1.00	5.00	28.8	< 0.001
Teleworking in the context of crisis	3.75	0.80	1.00	5.00	21.8	< 0.001
Comparison with attendance	2.91	1.12	1.00	5.00	1.9	0.056
Online evaluation	3.39	0.86	1.00	5.00	10.5	< 0.001
Monitoring of learning	3.33	0.95	1.00	5.00	8.04	< 0.001
Total	3.60	0.56	1.26	4.89	25.2	< 0.001

TABLE 4 | Differences in expectations between people with and without training in virtual education.

Dimension	Without training (n = 36)		With training (n = 510)				
	M	**SD**	**M**	**SD**	**t**	**p-value**	**d**
Institutional engagement	3.62	0.70	3.74	0.68	t(39.8) = 0.97	0.337	0.17
Professors self-efficacy for online education	4.03	0.73	4.13	0.60	t(38.3) = 0.85	0.400	0.18
Interaction with students	2.78	1.02	2.87	0.96	t(39.5) = 0.51	0.614	0.09
Learning resources and activities	3.75	0.86	4.04	0.64	t(37.7) = 2.00	0.053	0.45
Academic planning	3.70	0.72	3.85	0.68	t(39.5) = 1.17	0.250	0.21
Teleworking in the context of crisis	3.51	0.84	3.76	0.80	t(39.6) = 1.74	0.090	0.31
Comparison with attendance	2.65	0.95	2.93	1.13	t(42.3) = 1.68	0.100	0.25
Online evaluation	2.95	0.84	3.42	0.85	t(40.2) = 3.19	0.003	0.54
Monitoring of learning	3.08	1.02	3.34	0.94	t(39.3) = 1.49	0.145	0.27
Total	3.41	0.61	3.62	0.55	t(39.2) = 1.95	0.058	0.37

engagement and academic planning, were the dimensions that received the highest score, that is, that professors in these cases present positive expectations about these elements. However, it was observed that the dimension of interaction with students received the lowest score, which was significantly lower than three points ($M = 2.87$).

Regarding the results obtained for questions oriented to the previous experience of the professors with online education, it was identified that 93.4% of the professors had received training in teaching an online course. Of the professors, 23.4% had taken an online course and 40% had developed two or more courses. On the self-evaluation for taking online courses, 84.9% considered that they had moderate to high skills for taking online courses. Using a non-parametric multivariate ANOVA test with 1,000 permutations, only significant differences were found in expectations attributable to participation in training courses (see **Table 4**), $F(3.6, 473.4) = 2.7$, pperm = 0.039, but not with respect to the course completion, $F(6.8, 1746.9) = 0.618$, pperm = 0.758, nor the perception of ability, $F(4.82, 71.47) = 0.852$, pperm = 0.478. The group that received training presents higher values on all scales, with differences ranging from weak to moderate when

considering effect sizes. Only the difference between people with and without training in online evaluation was significant, $p = 0.003$, $d = 0.54$.

Teaching Expectations and Their Link to Student Academic Performance

Linear mixed models were used to model the relationship between professors' expectations and student performance (H3). In the initial model investigation, non-linear relationships between students' previous and current performance were found; hence, they were modeled as quadratic effects. Specifically, the difference between the three models was tested: Model 1, with control variables for professors and students; Model 2, which considers the effect of expectations on performance; and Model 3, which considers interaction effects between previous performance and professor's expectations on performance during 2020.

Using the likelihood ratio test, no significant differences were found between Models 1 and 2, $X^2 (9) = 8.82$, $p = 0.45$, indicating that professors' expectations have no direct effect on students' current academic performance. However, there

TABLE 5 | Model 1, 2 and 3 adjustment coefficients and indicators.

TABLE 5 | Continued

Coefficient	Model 1		Model 2	
	Estimate	valor-*p*	Estimate	valor-*p*
Fixed effects (Intercept)	−0.59	0.152	−0.53	0.207
Student gender = Male	−0.10	< 0.001	−0.10	< 0.001
Age at entry	0.00	0.771	0.00	0.780
Type of establishment = Private paid	0.07	< 0.001	0.07	< 0.001
Type of establishment = Particularly subsidized	0.04	< 0.001	0.04	< 0.001
Establishment type = No information	0.01	0.808	0.01	0.805
Secondary Notes	0.10	< 0.001	0.10	< 0.001
Secondary notes².	0.01	< 0.001	0.01	< 0.001
PSU Language	0.03	< 0.001	0.03	< 0.001
PSU Language²	−0.01	0.003	−0.01	0.003
PSU Math	0.04	< 0.001	0.04	< 0.001
PSU Mathematics²	0.01	0.026	0.01	0.026
No previous university grade	0.65	0.004	0.65	0.004
Previous notes university	0.62	< 0.001	0.62	< 0.001
Previous university grades².	0.32	< 0.001	0.32	< 0.001
Professors gender = Male	−0.09	0.204	−0.09	0.211
Teaching discipline = Agricultural Sciences	0.48	< 0.001	0.48	< 0.001
Teaching discipline = Medical and health sciences	0.52	< 0.001	0.56	< 0.001
Professors.discipline=Social Sciences	0.27	0.009	0.27	0.009
Teaching discipline = Humanities	0.21	0.163	0.23	0.123
Teaching discipline = Engineering and technology	0.24	0.076	0.25	0.072
Teaching day = more than 22 h	0.02	0.840	0.01	0.860
Experience–Training: Yes	0.09	0.516	0.07	0.630
Experience–Courses : 1	−0.04	0.652	−0.05	0.583
Experience–Courses : 2 or more	0.02	0.820	0.03	0.732
Self-reported ability: low skill	−0.21	0.603	−0.26	0.521
Self-reported ability: moderate ability	−0.12	0.757	−0.18	0.649
Self-reported ability: highly skilled	0.01	0.985	−0.06	0.890
Institutional engagement			−0.01	0.799
Professors self-efficacy for online education			0.12	0.013
Interaction with the student			0.02	0.687
Learning resources and activities			−0.02	0.626
Academic planning			−0.02	0.626
Teleworking in the context of crisis			0.00	0.959
Comparison with attendance			0.01	0.800
Online evaluation			0.03	0.617
Monitoring of learning			−0.05	0.329
Random effects σ Student	0.296		0.296	
σ Subject	0.497		0.496	
σ Professors	0.515		0.519	
σ Faculty	0.079		0.068	
σ Residual	0.532		0.532	
pseudo-*R*² Nakagawa and Schielzeth (2013) General	0.138		0.145	
Subject	0.410		0.410	
Faculty	0.077		0.080	
Student	0.023		0.005	
Professors	0.870		0.903	
Level 1–Subject	0.003		0.003	

(Continued)

It is considered as a reference point the female gender of professors and student, municipal establishment, discipline of the Natural Sciences professors, teaching day less than 22 h, no training in virtual teaching, no courses taken and no self-informed skills for online teaching.

are significant differences between Models 2 and 3, X^2 (81) = 213,506, $p < 0.001$, which indicates that teaching expectations influence performance, but as mediators of the effect of previous performance on current performance.

Table 5 shows the parameters and adjustment indicators for Models 1 and 2; the parameters of Model 3 are available as supplementary information (see **Supplementary Material**). In both Models 1 and 2, the coefficients for student gender, type of educational institution of origin, GPA, PSU Language and Mathematics, previous university grade, and professor discipline are significant. When analyzing the adjustment indicators of Model 3, the pseudo-R^2 goes from 0.145 in Model 2 to 0.153 in Model 3. The level that explains this improvement is the level 1— of grades in each subject, whose pseudo-R^2 goes from 0.003 in Models 1 and 2 to 0.01 in Model 3.

Figure 1 shows the current performance prediction curves as a function of previous performance, moderated by each of the expectation dimensions. In general, the variable that has the strongest level of influence on current performance is the previous performance in the subject. This relationship is U-shaped, with the lowest point located in note 5.0, being the minimum considered sufficient. The rest of the variables (GPA, PSU Language, and PSU Math) present approximately direct and linear relationships, although of less intensity.

When analyzing the patterns by expectation variables, the professor's self-efficacy dimension for online education shows a
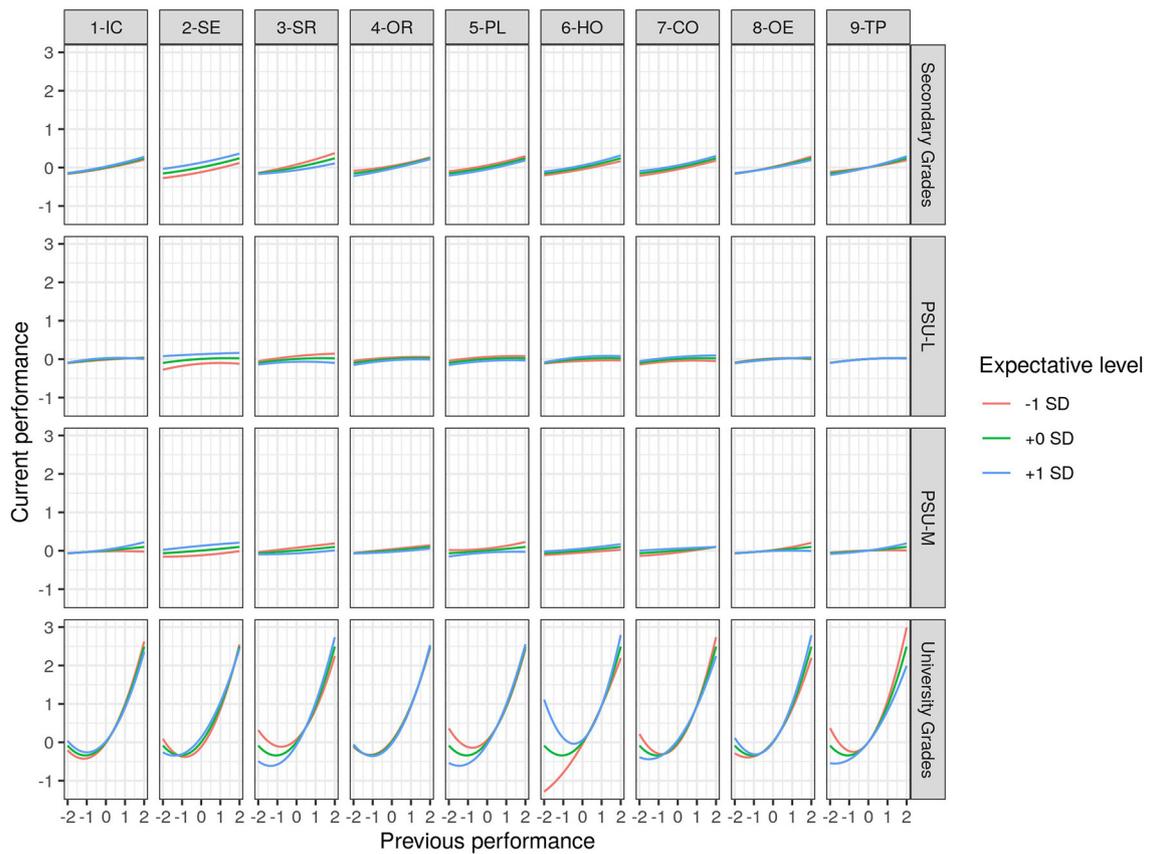
FIGURE 1 | Moderation of expectations in the relationship between previous and current performance.

pattern of parallel curves, where the form of the relationship is maintained for all levels of self-efficacy. However, the averages are higher for professors with greater self-efficacy. In the variable where the moderating effect is most strongly observed, it is in the previous performance, specifically in the grades under the inflection point of the U-curve. Two patterns stand out. First, for the variables of student interaction, academic planning, and monitoring learning, performance for students under the tipping point is lower if professors have high expectations for these variables. Concerning the second pattern, in professors who have low expectations for teleworking in a crisis context, the U pattern is broken and a linear relationship is observed between previous performance in the university and current performance, which does not occur in professors with medium or high expectations, where the usual U pattern is replicated.

The relative effect of each of the dimensions is analyzed, by considering the difference between the complete Model 3 and Model 3 by eliminating each of the dimensions separately. In **Table 6**, it can be observed that six of the dimensions (Institutional Engagement, Interaction with the student, Academic Planning, Comparison with the attendance, Evaluation in line, and Monitoring to the learning) when being eliminated from the complete Model 3, generate significant differences in the predictive capacity of the model.

TABLE 6 | Effect of each expectation dimension on Model 3.

Dimension	X^2(10)	p-value
Institutional engagement	23.4	0.009
Professors self-efficacy for online education	16.52	0.086
Interaction with students	41.5	< 0.001
Learning resources and activities	6.24	0.795
Academic planning	22.84	0.011
Teleworking in the context of crisis	17.90	0.057
Comparison with attendance	33.91	< 0.001
Online Evaluation	25.65	0.004
Monitoring of learning	31.76	< 0.001

Likelihood ratio test compares Model 3, against Model 3 without each specific dimension.

DISCUSSION

This study aimed to analyze professors' expectations about online education and relate them to students' academic performance during the COVID-19 pandemic, considering sociodemographic factors, university entrance, and the previous university performance of the students. The professors' expectations for

online education in the COVID-19 pandemic and student performance are discussed in relation to their previous experiences with virtual education.

Professors' Expectations and Previous Experience With Virtual Education

The results identified generally positive expectations for online education in educators during the COVID-19 pandemic. H1 was confirmed (professors had positive expectations for online teaching). Positive expectations were identified in the professors' self-efficacy for online education, that is, professors' belief in their ability to teach online. This is followed by the dimension of institutional engagement, which evaluates the university's ability to provide technological and pedagogical support to address delivery of subjects and academic planning, a dimension referred to the expectations in communicating and developing the subject according to the planning.

Professors' self-efficacy for online education is defined as judgments about their ability to achieve the desired results in student learning and participation. These beliefs affect the effort that professors invest in the teaching process, which benefits planning and organization, applying new teaching methodologies, and meeting students' needs (Tschannen-Moran and Woolfolk Hoy, 2001). Studies report that professors are more confident in carrying out their professional work (Giménez-Lozano and Morales-Rodríguez, 2019). Professors' self-efficacy is considered as an indicator that can make a difference in the learning outcomes of students in their course (Hampton et al., 2020).

Regarding institutional engagement, professors feel confident about the contribution of the university as an institution in the process of transitioning to online education due to COVID-19. These results are congruent with a meta-analysis study describing the different typologies adopted by universities around the world during the pandemic. Many universities have shown commitment in the transition process to online education due to the pandemic, and institutions have taken advantage of the potential created by forced virtualization to facilitate flexible and innovative digital education methods (Crawford et al., 2020), facilitating the construction of platforms and resources linked to quality online education.

The third dimension, with positive expectations from professors, was academic planning, which referred to the expectations in communicating and developing the subject according to planning. For an appropriate development of teaching in online environments, professors need to be prepared and motivated to re-design instruction with good pedagogical sense and effectiveness. Therefore, professors feel expectations to modify and adapt their traditional planning models to new procedures and methodologies that contribute to improving the quality of teaching and learning processes at distance. Authors, such as Green et al. (2020), report that in other countries, the transition process due to the pandemic began during the first semester of 2020; at that time, professors in different countries had to quickly redesign what they had prepared in advance for the semester, unlike professors in Chile, who began the academic year during March 2020 and were able to evaluate the scenarios adopted in other institutions at the beginning of the year.

Low expectations were identified in terms of student interaction. This finding is similar to that reported in other studies, where university professors feel less competent in the relationships they establish with their students during the development of online courses (Hampton et al., 2020); although professors have positive expectations regarding academic issues, it seems that the establishment of social relationships with their students is a process that is weakened. These beliefs on the part of the professors may be a consequence of the evaluation processes that professors carry out, based on the characteristics of the subject they teach and on their students (Barriga et al., 2019). However, it is important to note that the relationships between students and their professors are associated with academic results, participation, and the risk of dropout by young people (Kincade et al., 2020).

Regarding the second hypothesis, which refers to the effects of previous experiences teaching online courses on professors' expectations (H2), we found an effect of training in virtual education, where untrained professors had lower expectations than trained ones. It is important to consider this finding during the transition to online education in the COVID-19 pandemic, and training educators in online learning environments contributes to the quality of teaching planning and facilitation (Amador Solano and Espinoza Guzmán, 2017). Training provides professors with the opportunity to strengthen their skills and knowledge to drive learning within virtual environments (Odunaike et al., 2013).

Teaching Expectations and Their Link to Student Academic Performance

With respect to linking professor expectations to their students, (H3), the results did not identify relationships between professors' expectations and their students' current academic performance, after controlling for the previous grade (high school GPA), scores on university selection tests (PSU), and previous performance (GPA) in the career of higher education students. It seems that the student's academic performance is a variable that is more related to elements of the student, such as motivational factors like academic self-efficacy, self-regulation in learning, and effort regulation, etc. (Richardson et al., 2012). Likewise, in H4, where it was expected to find differences in the importance of the dimensions of teaching expectations in the prediction of student performance, it was possible to identify how the different dimensions of the questionnaire on teaching expectations independently moderate the relationship between the previous academic performance of students and current academic performance. This finding is related to the results presented by Adnan and Anwar (2020), who argue that, due to the pandemic and its consequences, the academic performance of college students has been affected by multiple factors, including educator-related factors.

Finally, in response to H5, which hypothesized that expectations moderate the relationship between previous and current educational performance. From the results, it was

possible to find a statistically significant moderating effect of professors' expectations on changes in the relationship between students' previous academic performance and current academic performance. This finding is important, particularly because it appears that the greatest influence is found in how expectations affect previously underperforming college students, strengthening or decreasing the inverse relationship between previous and current pandemic performance in that group.

Although a limitation of the longitudinal research is the loss of participants in T2. The participants belonged to a single university, which, although it includes students from all over the country, these results should be incorporated or analyzed in teachers from other universities, both public and private. Another limitation could be that the questionnaire was measured in the context of emergency education, which may alter the findings with respect to the factorial structure of the instrument and its subsequent analysis. Further research on the subject is suggested.

Among the strengths of this study, is its contribution regarding educational expectations in the context of higher education and their relationship to the success of university students, a line of research where few studies have been identified (Li and Rubie-Davies, 2016, 2018; Timmermans et al., 2018). It has also presented results on the effect of educator expectations on the academic performance of their students, statistically controlled for other variables of interest, such as previous academic performance, which is particularly valuable in noting the strength of the relationship between previous university performance and current performance (Wang et al., 2018).

The practical implications of these findings lie in the importance of professors' expectations regarding online education and its effects on changing student academic performance, especially during the first academic year where young people are in a process of adapting to the new demands of university life (Cobo-Rendón et al., 2020). For universities, these results are useful in the construction of strategies for continuous professor training, where it is possible to promote positive expectations in the development of online courses and positively impact educators and students.

Future studies could investigate how professors' expectations serve as moderators in other cognitive variables that motivate students, such as academic self-efficacy, academic engagement, and self-regulation of learning, which are essential for adaptation to and success in university.

Studies of this type evaluate interested professors and improve their performance by identifying areas of virtual education with lower expectations. It also allows professors to identify "strengths" in virtual education that they could then maintain and enhance. It is beneficial to anticipate expectations and identify the dimensions that contribute to university decision-making in educational policy and the impact of expectations on critical careers. For universities, these results are useful in the construction of strategies for continuing teacher education, where it is possible to promote positive expectations in the development of online courses, and positively impact both professors and students.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the ethics committee of university of Concepcion. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

KL contributed to the design of the study, literature, and writing of the manuscript. CB-N contributed to the design of the study as well as data extraction, data analysis, and review of the abstract and manuscript. RC-R and CF contributed to the design of the study, interpretation of the results, and review of the abstract and manuscript. CB and AM contributed to the interpretation of the results and writing the manuscript. All authors contributed to the article and approved the submitted version.

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How Personality Traits Are Related to the Attitudes Toward Forced Remote Learning During COVID-19: Predictive Analysis Using Generalized Additive Modeling

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Background: During the COVID-19 pandemic, universities all over the world have had to reorganize their work for remote education to ensure continuity of learning. This situation has forced both teachers and students into an atypical, very specific situation, in which they need to cope with a number of psychological factors. Meanwhile, there is a research gap in academic knowledge of the social and psychological factors that determine attitudes toward forced remote learning.

Objective: To analyze the psychological traits of students in relation to their attitudes toward forced remote learning.

Methods: The study assessed self-regulation and communication skills, as well thinking and learning styles of 280 students in the situation of forced remote learning. We used the methods of surveying and psychological testing for data collection. The data were analyzed in R statistical software using the regression modeling methods.

Results: We found that the number of students with positive (46%) and negative (54%) attitudes toward forced remote learning during the COVID-19 pandemic was approximately equal. Using regression analysis, we identified several statistically significant associations between the interpersonal communicative skills of students (self-regulation, shyness, alienation, manipulative and cooperative communication styles) and their thinking styles (right-hemispheric and integrated), on the one hand, and their attitude to remote learning, on the other. It was also illustrated that depending on the attitude to the forced remote learning, students differ by the percentage of assimilated learning materials while studying under the lockdown.

Conclusion: The results identify that success of remote learning in many ways depends on the extent to which it accommodates psychological traits of students who are forced to acquire new knowledge without traditional classroom instruction.

Keywords: COVID-19 pandemic, forced remote learning, diverse educational needs, attitudes toward remote learning, communicative and personal traits, thinking and learning styles, university students

INTRODUCTION

During the COVID-19 pandemic, educational institutions in more than 150 countries have faced unprecedented circumstances: All the campuses were closed, and learning was continued only remotely, mostly—with the use of digital platforms. Simultaneously, together with the risks, new opportunities have emerged. The forced transition to remote learning has prompted teachers and students to accelerate their mastery of digital technologies.

The coronavirus pandemic has had a substantial number of indirect effects, including those related to education and learning. As schools all over the world were compelled to shift to remote learning due to the closure of educational institutions, some 1.5 billion students have been affected by these necessary policy measures. Despite a lot of discussion, when it comes to the macro side of the situation, such as the effectiveness of the educational policy responses, not much is known about the psychological aspects of remote learning. It should be noted that this is the first time that the mode of learning has changed so substantially: learning based on physical person-to-person interaction between a teacher and a student in a classroom is not possible in a situation of school closures on a global scale. In these circumstances, both teachers and students need to cope with a number of psychological factors (Seymour-Walsh et al., 2020). It is critical to study the topic of remote education not only as a learning system, but also as a psychological phenomenon that includes such components as personal thinking styles and learning motivation, mental processes (e.g., creative thinking and spatial cognition), and psychological mechanisms (Yan et al., 2003; Singh and Thurman, 2019).

The current situation has a negative effect on people's well-being. The indeterminacy of the situation causes increased anxiety in students who are in self-isolation during the lockdown. At the same time, the efficacy of coping strategies mostly depends on the psychological characteristics of the people involved, particularly their level of life-satisfaction (Rasskazova et al., 2020).

Analysis of academic research in Russia and abroad has made it possible to identify risks, difficulties, and advantages of remote learning. Several groups of difficulties exist with regards to students' experiences during the transition to the remote learning mode: psychological, socio-psychological, social, operational, and difficulties related to risks for mental and physical health (Grigoryev, 2020). Psychological difficulties include a loss of basic cognitive skills, greater demands on the psychological qualities of teachers, difficulties in motivation and self-discipline. Socio-psychological difficulties are closely related to the loss of direct contact both between teacher and student and among students, with a loss of real support that can lead to loneliness and anxiety. An increase in social autonomy, alienation between students and teachers, cyberbullying, and cyber trolling are problems students face when it comes to the social aspect of remote learning. In the operational field, the issue lies in the administration of the learning process, staff qualifications and university resources to deliver remote learning, including the schedule and the process of examination (Henderson et al., 2017). The last group of difficulties identifies the risks related to physical and mental health, which includes difficulty in understanding the subject matter, visual impairment, physical inactivity, depressive states, as well as existential and ethical risks (e.g., virtualization of life, digital addiction; Jewitt, 2017).

The obvious advantages of remote learning for students include, first of all, freedom to choose the time and place of study, the possibility of repeatedly referring to the recordings of lessons, viewing training materials and assignments, and access to the experience of leading teachers all over the world (Mullagaliev and Urazlina, 2017; Sorokova, 2020). Moreover, the use of animations and multimedia tools increases the amount of acquired material, compared with students' ordinary activities pre-pandemic (Kochetkova and Terskaia, 2017).

As Prudnikova and Poskakalova (2019) suggest, the use of such materials increases educational motivation, makes it possible to study on individual educational paths according to personal inclinations and the current level of a student's development, expands the intensity of training through the increase of the channels to receive information, and also combines a variety of teaching practices and technologies (Prudnikova and Poskakalova, 2019). However, independent studies that compared online and face-to-face education showed the latter to be more effective: students who took the online course scored lower for academic performance, satisfaction of basic psychological needs, motivation, demonstration of knowledge gained, and as a result, lower final grades (Bettinger et al., 2017; Hurlbut, 2018; Wang et al., 2019).

At the same time, another body of work showed that online learning helped highly motivated students with high intellectual abilities to expand their knowledge when online learning was used in addition to traditional methods (Heppen et al., 2017). Those students who learned using a blended approach, in which online resources complement, but do not replace, traditional education, showed almost the same high results as those who learned in a traditional format (Escueta et al., 2017; Darling-Aduana, 2019).

In the case of remote learning, classes require that students remain highly motivated, self-regulated, and able to organize their own activities. Difficulties in online interaction are caused by the inability to establish and maintain psychological contact through non-verbal communication between teacher and student (Muilenburg and Berge, 2005). The lack of eye contact, facial expressions, and gestures violates the logic of the learning process, can lead to a decrease in students' interest, and, as a consequence, reduce learning effectiveness (Phirangee et al., 2016).

Some authors emphasize that the use of digital technologies for remote learning should be based on the participants' age and psychological characteristics (Muilenburg and Berge, 2005; Verkhovskaia et al., 2016; Rubtsova et al., 2018). Meanwhile, there has been little research describing the relationship between the attitude of university students to remote learning, their adaptation to this learning mode, and their psychological characteristics. One of the few existing studies based on the analysis of focus group interviews suggest that students express a desire for a more personalized learning experience, but one

that is still highly social within learning communities (Shearer et al., 2020). The circumstances of the spread of COVID-19 have created high uncertainty regarding future formats of study at universities. All this makes empirical measurement of attitudes to forced remote learning among students a highly relevant problem.

Moreover, a research gap exists in academic knowledge on the psychological factors that determine attitudes toward remote learning, as well as psychological features that draw a portrait of students according to their ability to adapt to the new learning mode. This study aims to shed light on how psychological factors of students are linked to their attitudes toward remote learning during the COVID-19 outbreak.

DATA AND METHODS

Research Questions and Hypotheses

The major objective of this study is to identify the psychological characteristics of students in relation to their attitudes toward forced remote learning. As such, the study is guided by the following research question: What are the main personality traits of students with a positive attitude to remote learning, and of those who have difficulties in adapting to the rapidly changed learning practices? The cognitive interest of our investigation lies in understanding these patterns in the light of the special education needs of those students who demonstrate higher motivation and efficiency in learning.

A number of other research questions complements that objective, constituting the research agenda of the present article:

- Is there any shift in perceived academic performance of those students who could adapt to remote learning and those who couldn't?
- Is there any statistically significant effect of interpersonal communication traits on adaptivity to remote learning?
- What is the relation between attitudes to forced remote learning and personal style of thinking?

Research Design

The empirical part of the study was conducted in May 2020, employing the methods of survey and psychological testing for data collection. The sample consisted of 280 students (with 2–5 years of university education) from the Southern Federal University (SFedU) in Rostov-on-Don, Russia, of whom 23.1% were males and 76.9% were females; the average age of the sample was 21.5 years. They took part in the voluntary intensive online project "SfeduNet 2.0: Solutions for the Future." Students with the high cognitive orientation and a focus on intensive teamwork to achieve efficient results in the research affiliate were main participants of the project. They were selected on the voluntary basis, but in the process of psychological testing that estimated their self-efficacy, result-orientation, and teamwork skills. The students worked in the teams comprised of 10 members where they had to engage in various research projects in accordance with their cognitive interests. Choosing this group for research, we wanted to look at the forced remote learning through the eyes

of students with diverse learning needs, namely with high internal learning motivation, maximally focused on the development of their professional competencies.

Psychological Tests

For addressing the outlined research questions, we developed a short questionnaire. The students were asked about their attitude toward forced remote learning and were given two options to respond: either positive or negative. The second question dealt with the assimilated information and the students were asked the following: "How do you think, what share of information taught could you assimilate while studying in the forced remote learning situation?" The answers were given on the scale from 0 to 1 and thus reflected self-perceived efficiency of studying under the conditions of the forced remote learning. Finally, another important question of the questionnaire referred to the perceived change in the academic performance. As such, the students were asked if their academic performance while studying under the conditions of the forced remote learning changed, having three answer options: improved, worsened, or did not change.

For studying personality traits, we adopted the methods of psychological testing. As such, we used two psychological tests. The first was Kunitsina's (1991) scale on self-regulation and the success of interpersonal communication. Her approach allowed us to determine the communicative and personal characteristics associated with informal interpersonal confidential communication. It is particularly useful to identify the degree of communication skills and the presence of communication difficulties, the nature of these difficulties, and personal awareness about them. The test is comprised of 102 statement that characterize intensity of contacts with people. The statements are summarized in 26 subdimensions that outline different communication styles, such as: self-regulation, shyness, communicative skills, manipulativeness, cooperativeness, etc. For each dimension, the students were assessed on the scale between 0 and 12.

Torrance's (1990) classification of students by their thinking and learning styles on three groups, those who have a dominant left hemisphere (emphasizing logic and analysis), a dominant right hemisphere (emphasizing emotions, intuition, images), or an integrated type (when both hemispheres are equally active), was the second psychological test used in the study. The test includes 40 statements (that result in 40 max score points) regarding behavior of a person in various hypothetical situations. The statements are accompanied by three answer options, each corresponding to a specific thinking style— left, right. Hemispheric, or integrated one. By the end of assessment, respondent gets a specific score in each of the three domains, where higher values indicate the dominance of the respective thinking style. As a result, each participant gets a score by distributing 40 points across three dimensions depending on the answers.

Data Analysis

The data analysis of data started with descriptive statistics to provide an overview of the sample parameters and frequency distributions. Attitude toward forced remote learning was a

dependent variable of the study, with binary responses: positive and negative. Predictors included the following variables on the continuous scale: percentage of assimilated learning information that came from the questionnaire and set of scores obtained through the psychological testing via Torrance's (1990) and Kunitsina's (1991) scales. As such, a set of continuous variables that described interpersonal communication styles referred to quantitative assessment of students on their exposure to manipulative, alienated, shy communication styles, as well as their skills in interpersonal communication. Test of Torrance's test of thinking and learning styles allowed us to assign to each student a score on the scale from on their exposure to three aspects: left-hemispheric thinking, right-hemspheric thinking, or integrated thinking. Finally, another categorical variable employed in the analysis referred to the perceived change in academic performance after the shift to the forced remote learning, a nominal variable with three outcomes: did not change (reference), improved, worsened. The data in **Table 1** present descriptive statistics of the key variables of the study that were derived in result of psychological testing. As can be seen by the close values of mean and median, as well as mostly low deviation of skewness from 0, most of the variables follow approximately normal distribution.

For assessing the significance of the differences between the means of the different subgroups we adopted the Wilcoxon rank sum test. We chose this test since the data did not follow a normal distribution and therefore a conventional t-test could give a misleading result. In the last stage, we employed regression modeling to understand how the relation of students to remote learning is associated with their personality traits and psychological characteristics. Since, as was mentioned earlier, the data do not always follow a normal distribution, we were seeking a model that allows non-linear functions for the predictors. In this context, the Generalized Additive Model (hereafter GAM), became an efficient solution. This statistical approach introduced by Hastie and Tibshirani (1990) and developed by Hastie et al. (2009, 2015) as advanced regression for prediction and classification. In comparison to regression modeling based on linear functions, GAMs have the advantage of capturing non-linearities and variation in data (Hill and Lewicki, 2006) through the application of non-parametric smoothing splines. Given that it is quite problematic to achieve linearity in associations between variables that measure attitudes and personality traits, GAMs have great explanatory power in modeling human behavior and

the potential of being effectively applied in the psychometrics and behavioral research.

All the data analysis was carried out in R, lingua franca of statistical computing.

RESULTS

Perceived Academic Performance of Students With Regard to Their Attitude Toward Remote Learning

The study aims to shed light on how psychological traits of students are linked to their attitudes toward forced remote learning. Our study shows that the students were divided into relatively equal groups by their attitude toward forced remote education: while 54% have a positive attitude to the forced remote learning, 46% have a negative one. The confidence intervals for the two groups overlap, which allows us to conclude that the associated levels of uncertainty for both student cohorts do not produce statistically significant differences. In other words, we cannot say that one group clearly dominates over the other, despite the difference observed in the frequency values.

Our first objective was to understand how the students differ in their perceived change in academic performance with regard to their attitude toward forced remote learning. While filling out the questionnaire, the students were asked about the percentage of information that they find easy to assimilate while learning remotely. Not surprisingly, those who have a positive attitude toward remote learning understand the material better ($M = 46.3$, $SD = 22.2$) than the students who are uncomfortable with remote learning ($M = 37.1$, $SD = 20.7$). Since the distribution of scores on the amount of successfully assimilated information did not follow the normal one (which is explicitly seen of **Figure 1**), we ran the Wilcoxon rank sum test to assess whether the difference was statistically significant. We found that the learning outcomes of students who are comfortable with studying remotely are significantly higher than those of students who did not adapt to the current situation, $W = 488.5$, $p < 0.05$.

In order to understand the magnitude of these differences, it is useful to examine the overlap between the two distributions (**Figure 1**). It turns out that both groups obtain multimodal distribution as several peaks are explicitly visible for both groups of students. It allows for hypothesizing that additional grouping

TABLE 1 | Descriptive statistics.

Variable	Min	Median	Mean	Max	SD	Skew	Kurtosis
Right hemispheric	2	10.9	10	20	4.4	0.23	−0.91
Left-hemispheric	1	11	11.63	23	4.19	0.41	0.16
Integrated	1	18	17.84	30	6.24	−0.21	−0.46
Communication style: manipulative	2	6	5.61	11	2.1	0.47	−0.49
Communication style: alienated	1	6	5.39	10	2.35	0.12	−0.9
Communication style: cooperative	3	7	6.71	11	1.67	−0.19	−0.27
Communication style: shy	1	6	5.96	11	2.28	−0.16	−0.25
Communication style: skillful	2	7	7.29	12	2.05	−0.26	−0.24

FIGURE 1 | Probability density function of the percentage of assimilated information with respect to attitude toward remote learning. The vertical lines indicate group means.
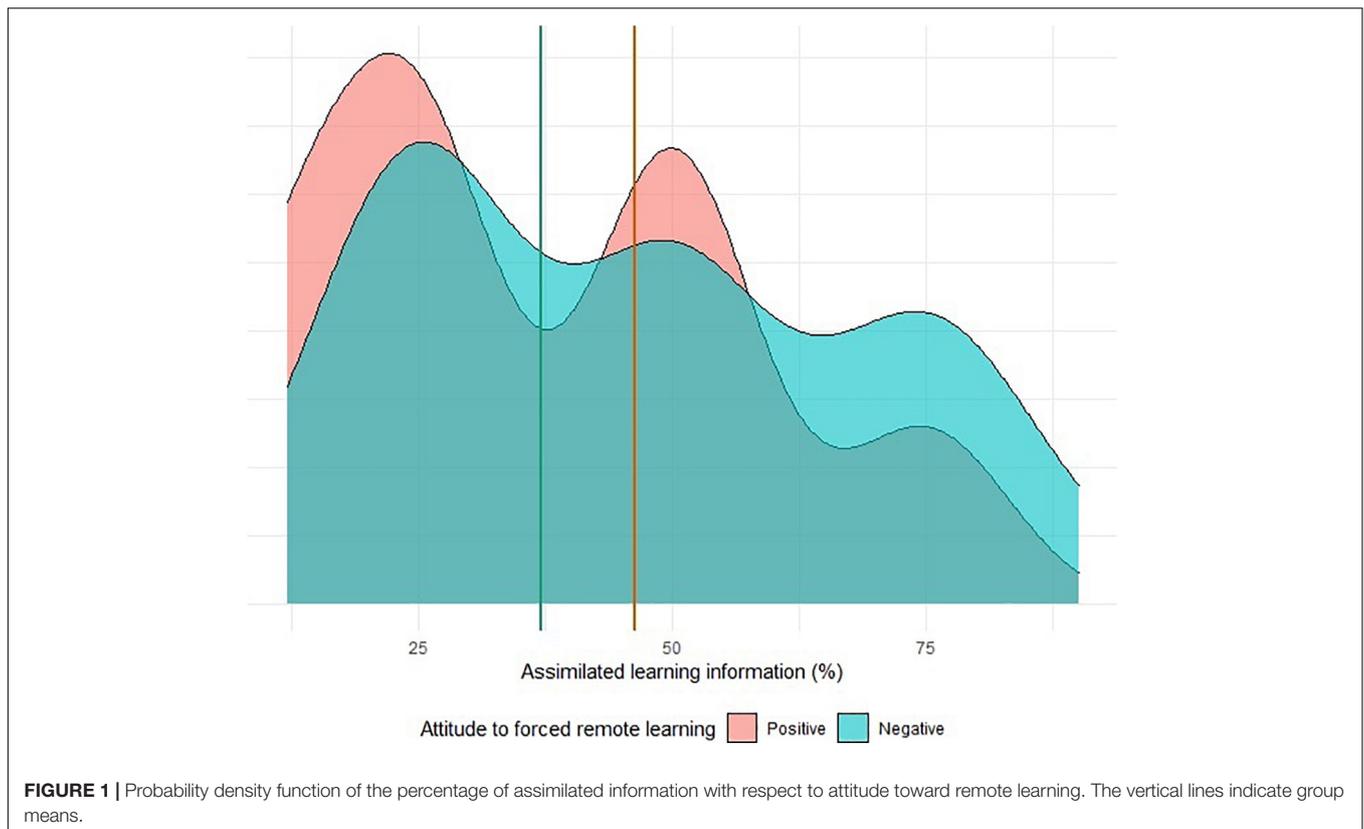
or clustering exists with regards to assimilation of the learning material, however, it is impossible to predict the factors behind it based on descriptive analysis only. The horizontal lines indicate that amongst students with positive attitude toward forced remote learning, the mean percentage of assimilated information is higher than amongst those who have a negative one. On the other hand, given that two groups show a high overlap in distribution, the substantial nature of these differences in practice is questionable.

Regression Models

Another important conclusion produced from the probability density plot pertains to the multimodal character observed in the distribution of scores on the percentage of information assimilated by the groups with positive and negative attitudes toward the forced remote learning. The graph allows us to hypothesize that there are multiple subgroups within the two plotted groups, and there are different psychological factors that affect the relationship between attitude toward forced remote learning and percentage of the information that is assimilated. It can be assumed that, for example, the distribution is affected by the presence of people with a different set of communicative skills or perceived change in academic performance or psychological type. To test these hypotheses in line with our research questions, the analysis needs to go beyond descriptive statistics. Therefore, we employed regression analysis using a GAM.

We built two regression models, both having "attitude to remote learning" as the dependent variable. The variable is a

binary one, with the values indicating a positive relation (coded as 1) or a negative relation (coded as 0) of students to the learning mode adopted due to the school closures. The first model was intended to assess the relation between the dependent variable and the students' communicative skills. It had the following equation:

$$
\begin{aligned}
Logit\left(Attitude\ to\ remote\ learning\right)\ &=\ Manipulative\ +\ Shy\ + \\
s\left(Alienated\right)\ &+\ s\left(Cooperative\right)\ +\ s\left(Skillful\right) \\
+\ s\left(Self-Controlled\right)\ &+\ Academic\ Performance\ +\ Gender,
\end{aligned}
$$

where s is a non-parametric smoothing spline, i.e., non-linear function used to describe a relation between a predictor and outcome variable. To run the analysis, we used mgcv package in R (Wood and Wood, 2015). The details on GAMs could be found in Wood (2017).

The second model was intended to estimate the effects of personal thinking and learning styles on attitudes to forced remote learning. It included the predictors in accordance with the equation below:

$$
\begin{aligned}
Logit\left(Attitude\ to\ remote\ learning\right)\ &= \\
s\left(Left\ hemisphere\right)\ +\ s\left(Right\ hemisphere\right)\ &+\ s(Integrated)
\end{aligned}
$$

The results of the models are summarized in **Table 2**. Since the models calculated are semi-parametric, i.e., they employ

TABLE 2 | Generalized additive models.

	Dependent variable: attitude to forced remote learning	
	Interpersonal communication skills model (1)	Thinking and learning styles model (2)
Communication style: manipulative	−0.710*** (0.244)	
Communication style: shy	0.585** (0.233)	
Communication style: cooperative	Non-parametric	
Communication style: alienated	Non-parametric**	
Interpersonal skills	Non-parametric***	
Perceived change in academic performance: improved	2.796* (1.556)	
Perceived change in academic performance: worsened	−1.005 (1.586)	
Left-hemispheric		Non-parametric
Right-hemispheric		Non-parametric**
Integrated		Non-parametric***
Constant	−0.075 (1.410)	−0.218 (0.311)
Observations	280	280
Adjusted R^2	0.512	0.140
Log likelihood	−36.360	−48.897

*p < 0.1; **p < 0.05; ***p < 0.01.
Coefficients of categorical variables are calculated with respect to reference categories: "Female" for Sex and "Did Not Change" for Perceived academic performance.
Italicized values represent models' fit statistics.

both linear and non-linear terms, for non-linear non-parametric smoothing splines no regression coefficient is produced. For meaningful interpretation of the non-parametric associations between independent and dependent variable, one needs to examine the figures to understand what kind of statistical trend is produced in outcome due to an increase in the predictor. Therefore, the full picture could be obtained only after exploring both **Table 2**, as well as **Figures 2**, **3** together.

The model of interpersonal communication skills revealed statistically significant effects of manipulative style, shyness, interpersonal skills, alienation, and perceived change in academic performance. The effects of manipulative style and shyness were linear. It can be said that the more manipulative is the student's style of interpersonal communication, the less likely that person is to have a positive attitude to forced remote learning. Based on the logit values in **Table 2**, it can be calculated that an increase of 1 unit on the manipulative style scale leads to a 5% decrease of the odds of having a positive attitude to remote learning. On the other hand, shy people have a higher probability of a positive attitude to remote learning: An increase of 1 unit on the shyness scale increases the odds of a positive attitude by 18%. Since the linear effects of interpersonal skills and alienation did not produce

meaningful results, we employed non-parametric smoothing splines to understand the effect of these predictors. Interesting effects were found among alienated people and those who have high interpersonal skills. The trend lines on **Figure 2** clearly indicate the relationship between these predictors and the output variables.

In the case of interpersonal skills, the line goes up but reaches a peak in the middle, then rapidly shows a negative trend. This means that those with low and intermediate interpersonal skills tend to have a positive attitude to remote technology, whereas those with highly developed interpersonal skills tend not to enjoy remote learning. A more complicated trend can be found when it comes to alienation. The curve, with its multiple peaks, demonstrates that different levels of personal alienation are associated either positively or negatively with remote learning. It can, however, be said that students who have the highest alienation scores tend to have a positive attitude to remote learning. Finally, those students who reported a positive change in their perceived academic performance have a higher probability of a positive attitude to remote learning than those who did not report any changes.

The second model was intended to assess the impact of personal thinking and learning style on the attitude to remote learning (**Figure 3**). The model identified statistically significant effects of students with the right hemisphere active and those with integrated thinking. None of the models identified a statistically significant effect of sex, which was a controlling variable.

Research Limitations

The major limitation of the study refers to the fact that two core questions of the questionnaire—those related to the percentage of assimilated information and change in academic performance after the shift to the forced remote learning, are not the actual learning assessment or psychological measurement of how well students assimilate learning materials and what is the change in their academic performance. Oppositely, the collected data are based on students' self-perceived reporting, i.e., it could present some positivity bias.

DISCUSSION

The results of our survey showed that the attitudes of SFedU students toward forced remote learning were divided approximately equally: 54% of students do not like this kind of learning and 46% have a positive attitude to it. Due to the overlapping confidence intervals of these two student groups, we cannot conclude that either of these groups is clearly dominant. The survey was conducted in May 2020, when students to some extent had already been adapted to remote learning and were able to analyze its strengths and weaknesses. Therefore, in the survey results, their attitude is expressed as a trend, rather than a personal position.

It should be noted that the participants were students at SFedU with diverse learning needs and high internal cognitive motivation. Thus, we can note that the students'

FIGURE 2 | GAM components (partial prediction), plots with 95% confidence intervals. Interpersonal communicative skills model.

FIGURE 3 | GAM components (partial prediction), plots with 95% confidence intervals. Thinking and learning styles model.
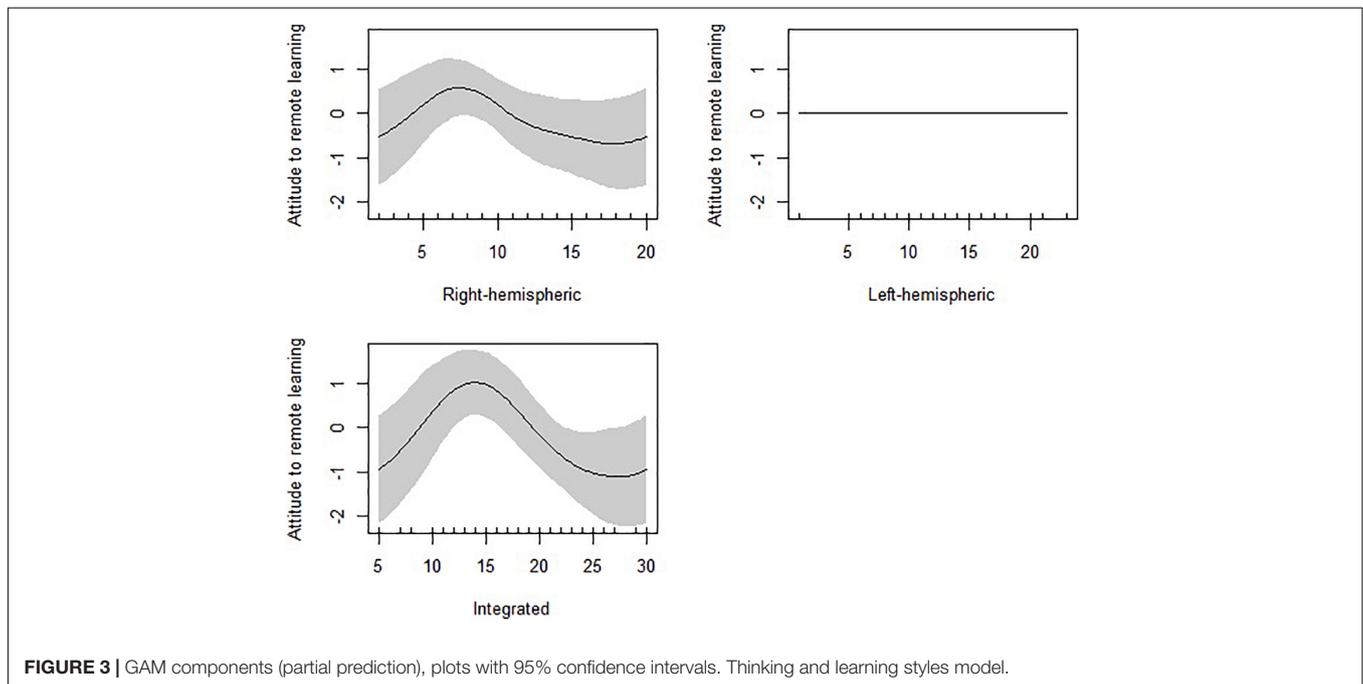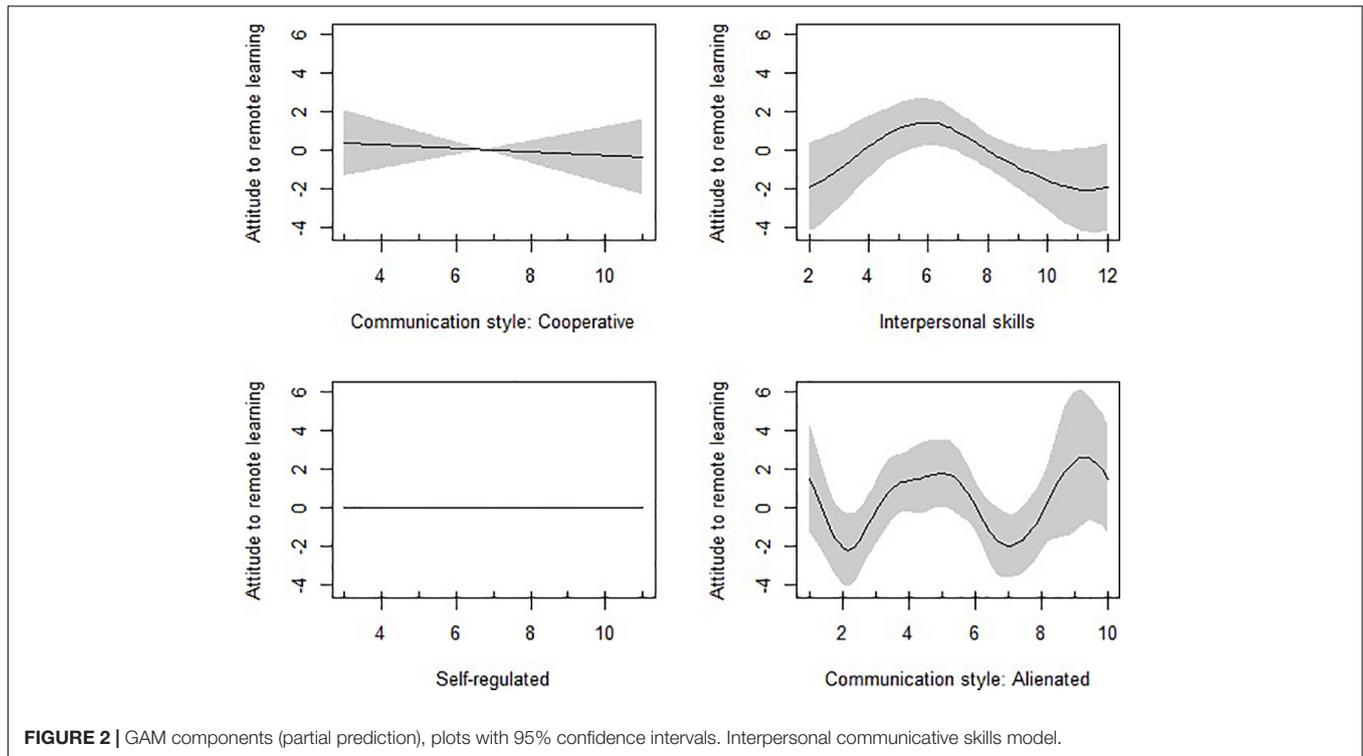
answers regarding remote learning concerned the format itself, and their attitude to educational and academic activities was initially positive.

A number of other factors related to learning in conditions of self-isolation could influence the negative attitude of some students to remote learning. First, students were forced to stay in the same room and could not leave the house, which can be regarded as a sharp change in their usual lifestyle; there was a dramatic increase in the time spent working at the computer, as well as stress caused by the need to transition abruptly to a new mode of education. Moreover, the reduced physical and intellectual load may have led to non-compliance with the remote learning process, adding a dimension to potential factors determining a negative attitude.

In addition to examining the attitudes of students, we were interested in the effectiveness of learning in the new format, so we examined the impact of students' attitudes toward the remote learning on their idea of the amount of information being acquired. Answers to the question about the percentage of information assimilated during remote learning confirmed that SFedU students who are positive about the new format learn more than students who have a negative attitude. We found that, on average, the information mastered by students with a positive attitude toward remote learning is 44% higher than among students with a negative attitude.

Such a result is quite expected and confirms the results of other researchers. Students who stated that they like to study remotely showed better academic results than those who do not like this form of study (Hurlbut, 2018). Also, in a large-scale study, both the effectiveness of remote learning and the pleasure of it (Muilenburg and Berge, 2005) were highlighted as variables that significantly affect the barriers of remote learning. At the same time, students in face-to-face learning tend to get slightly higher grades than those who study remotely (Hurlbut, 2018).

The results of the first regression model detected several patterns in the association between the students' communicative and personal characteristics and their attitude to forced remote learning. There was an inverse linear relationship between manipulative communication styles and a positive attitude toward the remote learning format. The more a student is inclined to be manipulative, the lower the probability of a positive attitude to remote learning. Most often, such students talk about technical difficulties that supposedly do not allow them to turn on their computer's camera or even the microphone. But in doing so, they limit the channels of information to the interlocutor, prompting him or her to concentrate on one thing (for example, the auditory channel).

A linear relationship was also found between shyness and a positive attitude toward the forced remote learning. Forced remote learning creates favorable conditions for its behavioral manifestations—silence, stiffness, a quiet voice. Shy students are comfortable in the solitude in which they find themselves because of self-isolation.

A complex non-linear relationship was found between the attitude to remote learning, on the one hand, and communication skills, as well as alienation, on the other. The highest probability of a positive attitude toward remote learning is among students whose communication skills are developed to a moderate degree. For them, communication is a personal resource for improving academic performance. The level of development of their communication skills allows them to establish psychological contact with teachers and classmates, if necessary, to remove emotional stress, which generally positively affects the content of communication. Students with either highly or poorly developed communication skills have a lower probability of a positive attitude toward remote learning. For students with highly developed communication skills, the technical limitations of the online environment constrain them, making non-verbal communication difficult for themselves and other interlocutors. They perceive online communication as inadequate. Students with poorly developed communication skills have difficulty initiating and maintaining communication.

Regarding alienation, we revealed a complex relationship. With a different degree of alienation among students, their attitude to remote learning can be either positive or negative. Stepanova and Kalacheva (2018) note that remote learning refers to alienating technology. It minimizes the personal interaction of students and teachers. Instead of reasoning, arguing, and constructing an answer, the student chooses the answers presented in advance in the tests, which leads to the simplification of thinking. All this alienates from the freedom of creative designing of a cognitive situation and leads to its limited choice. At the same time, the authors acknowledge that online technology is a way to get rid of alienation in education, because it contributes to increasing the speed and effectiveness of educational activities carried out with their help, continuous updating of its content (Stepanova and Kalacheva, 2018).

It is likely that the relationship between alienation and students' attitudes toward forced remote learning is ambiguous and is mediated by the specific technologies that the teacher uses. If it stimulates the exchange of information and joint work of students in the Internet environment, then this contributes to the development of their cognitive activity and formation as a person, not alienating themselves from society. It can be said that alienation in education and the role of Internet technologies need to be further developed.

Using the second model, a non-linear relationship of students' right-hemispheric and integrated thinking styles in relation to forced remote learning was revealed. The study identified the associations between students' thinking styles and their attitude to remote learning. The probability of a positive attitude will be higher with a weak degree of dominance of the right-hemispheric style of thinking and with a slightly more prominent, but not clearly dominant, integrated style. The relationship between the attitude to remote learning and left-hemispheric style, as well as differences in males or females were not identified. This means that the probability of a positive attitude toward remote learning is higher for those students who are quick to navigate the situation, can flexibly change their thinking strategies, choosing the most suitable for solving the task. Probably, such students should have their own thinking strategy, which allows them to save energy and time. For many countries in the world, remote learning is no longer a temporary emergency situation but has started to become something more long-term. Highly likely, a lot of countries or educational institutions all over the world will shift to blended learning in the near future. The experience gained through the organization of forced remote learning could become essential in incorporating good practices that facilitate psychologically comfortable environment for all learners. However, the results of our study explicitly outline that the attitude toward remote learning, as well as assimilation of the learning material while studying under the conditions of forced remote learning, are in many ways associated with personality traits. Though further research is needed to shed light on how effective is remote learning in comparison to the traditional modes of delivery, one needs to bear in mind that adapting to this learning modality might be challenging for the key actors.

CONCLUSION

The study suggests that when it comes to the students with high learning motivation, they differ in terms of relation to forced remote learning. Moreover, shift to forced remote learning resulted in the assimilation of learning material. In general, association between the communication and learning styles on the one hand, and attitude to remote learning on the other hand, provides a convincing evidence that personality traits have their say in the ways how students adapt to the new learning modalities. These conclusions have implications on the ways remote learning should be organized at higher education institutions.

As the study evidence that not all highly motivated students are comfortable with remote learning, the solutions adopted by the universities should account for the potential impact on the motivation and learning needs of those students who before the pandemic demonstrated increased interest in pursuing education. As coming "back to normal" does not seem to be realistic even after 1 year of the pandemic in many countries of the world, education policy makers are challenged by the requirement to not only ensure connection of the enrolled young people with learning, but also to fully satisfy the diverse learning needs of students, accounting somehow for their personal traits. New learning approaches, based on blended modalities, can be put in place as a potential solution if the epidemiological situation at place allows for that. However, given the unique educational context and pandemic rates in all the countries, no universal solution can be proposed. Education stakeholders should monitor the psychological well-being of students on a regular basis, which could allow for data-driven and efficient policy solutions which are specific to a context.

The results can be useful for summarizing the experience of higher education at the emergency conditions of the COVID-19 pandemic, in order to adapt and develop optimal educational formats at universities. As our analysis confirms that the attitude to remote learning is in many ways associated with personality traits, the results highlight both challenges and potential areas for improvement in terms of establishing remote learning. While some students could be prone of adopting manipulative communication styles trying to camouflage their engagement in learning, others do their best to benefit from this situation by setting comfortable conditions for studying. As such, future psychological research should inform better

decisions on involving alienated and shy students into learning more. Other possibilities for further analyses include studying the links between psychological characteristics of university students and their attitude to other challenges and perspectives of various forms of online (synchronous, asynchronous), offline, and blended learning.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article are not included in the article/supplementary material to preserve participants' confidentiality, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of the Academy of Psychology and Educational Science of Southern Federal University, Rostov-on-Don, Russia. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

LD demonstrated research relevance, selected and analyzed the material, and analyzed, interpretated, and processed the results. GA completed data processing, statistical data analysis, and results analysis. ID collected empirical data, worked with respondents, conducted psychological testing, and selected research methods and techniques. VK demonstrated relevance of the research, analyzed available studies, and summarized results and prepared conclusions. VE adapted and translated the text, edited the material recorded, and selected and analyzed both the material and references. All authors contributed to the article and approved the submitted version.

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Preserving Cornerstones of Student's Assessment in Medical Education During COVID-19

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Since the outbreak of the pandemic caused by COVID-19, there was a significant disruption in our day-to-day life. To control the spread of COVID-19, several measures were taken, including social distancing and isolation. All educational systems were seriously compromised, and medical education, in particular, was heavily hit by those measurements, leading to the challenge of redesigning the current form of teaching. Worldwide, there was a trend of moving all the learning and teaching activities to online. The transition from face-to-face to online activities was not an easy task, especially for low- and middle-income countries (Cecilio-Fernandes et al., 2020). Overall, the transition focuses on the knowledge part of the curriculum and a few medical skills, which were predominantly skills that required non-motor skills, such as communication and clinical reasoning. Although an essential part of the medical curriculum is work-based learning, there is still a need to assess students, as we come to the end of the semester. In this perspective paper, we highlight different methods of assessment and how we make a sound decision about students' progression.

As online teaching has focused on knowledge, it is not fair and feasible to assess students' skills that are taught at bedside, which includes most of the medical skills, attitudes, and competence. Since a proper alignment between learning objectives, strategies, and assessment are vital for any medical curriculum (Prideaux, 2003, 2007), students' assessment should be re-aligned with the new content of teaching. Since the online learning objectives are low in Miller's pyramid, it is only possible to assess students at the level of "knowing" and "knowing how" (Miller, 1990; Wass et al., 2001). Therefore, we should only use assessment tools that are aligned with those two levels.

Different assessment methods can be used to assess the "knowing" and "knowing how" level at Miller's pyramid (Miller, 1990). Although this article will not discuss the various methods, here is a shortlist that may be used in online assessment: multiple-choice questions, essays, short answer, very short answer, open-ended questions, open-book questions, case study, oral examination, and many others. Indeed, the problem is not in the lack of options but in how we can make a fair assessment while assuring that students will not cheat in an online environment.

To answer that question, first we need to understand that end of semester tests, or having two tests a semester, was already lacking. Students often cram before end of semester tests, leading to a low retention of the material. Also, students are often overwhelmed with the number of tests at the end of semester, which forces them to study for some tests while disregarding others. With the transition to online teaching and now assessment many medical educators realized that they should use other types of assessment methods, creating an opportunity to use best practices in assessment. Many curricula focus the decision of pass/fail students on a high-stakes test. High-stakes test refers to the stake of the exam, meaning that if only one test will decide whether you pass or fail, we call it a high-stakes test (Norcini and McKinley, 2007). This type of test leads to students studying for one test, which hampers learning (Wrigley, 2012). Also, this type of test is relatively applicable in

face-to-face education, since all students have to take the assessment at the same time and at the same place, which, in turn, makes cheating unlikely. In an online environment, however, we cannot control the setting, opening the door for cheating. Therefore, many medical educators are looking for different strategies of assessment for an online environment.

If the idea is to keep the high-stakes test, there are two options. First, there are online proctoring and psychometric forensic programs that can help. Those programs make it possible to watch all the students via webcam and more advanced ones also track the gaze of your eyes, making sure that students are only looking at the screen (Weiner and Hurtz, 2017). Psychometric forensic refers to track all questions to verify whether there is a change on the item psychometric pattern, during and after the test (Cizek and Wollack, 2017). Those software are expensive and require specialized workers that currently are scarce in Brazil. Second, a computerized adaptive test could be used. The computerized adaptive test refers to an algorithm that will select the next questions based on students' previous performance (Cecilio-Fernandes, 2019; Collares and Cecilio-Fernandes, 2019). This makes the test unique to every student, therefore decreasing the likelihood of cheating. Also, computerized adaptive tests identify students' knowledge gaps more precisely than the traditional format. Finally, students' motivation increases, since they will answer a test that is aligned with their level of knowledge. Although there is free software for computerized adaptive tests, there is a need to have a psychometrician with experience running this type of test. These two options may be feasible for some medical schools, but the majority may not have enough expertise or funding, due to the complexity of both solutions.

From a psychometric point of view, high-stakes tests should provide evidence of validity, reliability, and standardization. Validity refers to whether the test is measuring the proposed construct. Reliability refers to the amount of error in a test and whether the scores are reproducible over time. Standardization refers to how the scores are calculated based on a large sample (American Educational Research Association, 2014). Unfortunately, high-stakes tests in medical schools do not achieve the psychometric rigor necessary to make a fair decision, leading to an unfair decision in many times.

Shifting the paradigm from high-stakes tests to several low-stakes tests seems more realistic to our reality. Actually, rather than being concerned with the pass/fail score, we now move to the original essence of assessment: did students learn? This new paradigm also brings us close to current best guides of assessment, moving toward a system of assessment (Norcini et al., 2018) or programmatic assessment (Prideaux, 2003; Schuwirth and van der Vleuten, 2011; van der Vleuten et al., 2012, p. 14). Both of these refer to using multiple methods of assessment during different points in time. Then, all these different methods and assessment are considered for the decision of the students. Considering multiple assessments has the benefit of changing students' behavior. For example, instead of studying for one test, now they have to study across the semester or year,

which, in turn, is beneficial for students' learning (Cecilio-Fernandes et al., 2017). Also, incorporating multiple methods of assessment gives a clearer evaluation of students as a whole and also decreases the likelihood of cheating, since students will have many tests. It is also possible to include clinical cases discussion, allowing a discussion between students. Using this system opens the door for many possibilities while assuring the psychometric rigor of the assessment program (Bok et al., 2018).

Making a decision on multiple tests also allows to include the formative character of assessment. By formative character, we mean feedback, since studies have shown that students feel demotivated with formative assessment compared to summative assessment. Also, there is a call to reconcile summative and formative assessment, since they are connected at their inception (Lau, 2016). Feedback is one of the most powerful tools for learning (for a review, please see Hattie and Timperley, 2007). Feedback avoids learning an incorrect knowledge by guiding students to the correct knowledge. Feedback also helps learners to identify the relevant knowledge and it motivates students by rewarding correct actions or correcting incorrect actions. Changing from high-stakes tests to low-stakes tests allows medical educators to incorporate feedback in the assessment, increasing students' learning.

Most high-stakes tests are based on closed- or open-ended questions. Using a multiple method of assessments allows other assessment methods to be included. For example, medical educators can now take the advantage of quiz at the beginning of each class, which would help teachers to identify students' knowledge gaps of previous content and also take advantage of the testing effect. Testing effect refers to students who are tested to perform better in a retention test than those who re-studied the material (Roediger and Karpicke, 2006). Also, teachers could include case discussion and group work as part of the decision making. Including different methods of assessment allows for assessing students with a different lens and given feedback on different aspects of students' knowledge.

Noteworthy, online teaching and assessment have mainly focused on knowledge. We have demonstrated that it is possible to make a fair decision on the students' future. However, this may be limited to preclinical training. For the clinical years, it is possible to teach and assess to an extent. Of course, we are going through difficult times, but a discussion about clinical training is necessary. For example, we do not believe that it is possible to teach and assess clinical skills using online tools. Even clinical reasoning that is based on knowledge, the online platform, discussion, and cases are oversimplified compared to real-life scenarios. This discussion is even more important for the 6th year students who are about to graduate. Unfortunately, there is no right answer or a simple solution. Nevertheless, we need to consider whether we should approve students even cutting at least 30% of their practical training, which is perhaps the crucial part of the medical curriculum.

Shifting from face-to-face to online activities may have brought us a unique opportunity to change our knowledge assessment practice. Changing from high-stakes assessment to

multiple low-stakes assessments is an advance to the assessment field, and we hope that this change will last after the pandemic.

AUTHOR CONTRIBUTIONS

DC-F, AB, and PH contributed to the conceptualization, writing original draft, and writing—review and editing. All authors contributed to the article and approved the submitted version.

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Insights Into Students' Experiences and Perceptions of Remote Learning Methods: From the COVID-19 Pandemic to Best Practice for the Future

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This spring, students across the globe transitioned from in-person classes to remote learning as a result of the COVID-19 pandemic. This unprecedented change to undergraduate education saw institutions adopting multiple online teaching modalities and instructional platforms. We sought to understand students' experiences with and perspectives on those methods of remote instruction in order to inform pedagogical decisions during the current pandemic and in future development of online courses and virtual learning experiences. Our survey gathered quantitative and qualitative data regarding students' experiences with synchronous and asynchronous methods of remote learning and specific pedagogical techniques associated with each. A total of 4,789 undergraduate participants representing institutions across 95 countries were recruited via Instagram. We find that most students prefer synchronous online classes, and students whose primary mode of remote instruction has been synchronous report being more engaged and motivated. Our qualitative data show that students miss the social aspects of learning on campus, and it is possible that synchronous learning helps to mitigate some feelings of isolation. Students whose synchronous classes include active-learning techniques (which are inherently more social) report significantly higher levels of engagement, motivation, enjoyment, and satisfaction with instruction. Respondents' recommendations for changes emphasize increased engagement, interaction, and student participation. We conclude that active-learning methods, which are known to increase motivation, engagement, and learning in traditional classrooms, also have a positive impact in the remote-learning environment. Integrating these elements into online courses will improve the student experience.

Keywords: online learning, COVID-19, active learning, higher education, pedagogy, survey, international

INTRODUCTION

The COVID-19 pandemic has dramatically changed the demographics of online students. Previously, almost all students engaged in online learning elected the online format, starting with individual online courses in the mid-1990s through today's robust online degree and certificate programs. These students prioritize convenience, flexibility and ability to work while studying and are older than traditional college age students (Harris and Martin, 2012; Levitz, 2016). These students also find asynchronous elements of a course are more useful than synchronous elements (Gillingham and Molinari, 2012). In contrast, students who chose to take courses in-person prioritize face-to-face instruction and connection with others and skew considerably younger (Harris and Martin, 2012). This leaves open the question of whether students who prefer to learn in-person but are forced to learn remotely will prefer synchronous or asynchronous methods. One study of student preferences following a switch to remote learning during the COVID-19 pandemic indicates that students enjoy synchronous over asynchronous course elements and find them more effective (Gillis and Krull, 2020). Now that millions of traditional in-person courses have transitioned online, our survey expands the data on student preferences and explores if those preferences align with pedagogical best practices.

An extensive body of research has explored what instructional methods improve student learning outcomes (Fink. 2013). Considerable evidence indicates that active-learning or student-centered approaches result in better learning outcomes than passive-learning or instructor-centered approaches, both in-person and online (Freeman et al., 2014; Chen et al., 2018; Davis et al., 2018). Active-learning approaches include student activities or discussion in class, whereas passive-learning approaches emphasize extensive exposition by the instructor (Freeman et al., 2014). Constructivist learning theories argue that students must be active participants in creating their own learning, and that listening to expert explanations is seldom sufficient to trigger the neurological changes necessary for learning (Bostock, 1998; Zull, 2002). Some studies conclude that, while students learn more via active learning, they may report greater perceptions of their learning and greater enjoyment when passive approaches are used (Deslauriers et al., 2019). We examine student perceptions of remote learning experiences in light of these previous findings.

In this study, we administered a survey focused on student perceptions of remote learning in late May 2020 through the social media account of @unjadedjade to a global population of English speaking undergraduate students representing institutions across 95 countries. We aim to explore how students were being taught, the relationship between pedagogical methods and student perceptions of their experience, and the reasons behind those perceptions. Here we present an initial analysis of the results and share our data set for further inquiry. We find that positive student perceptions correlate with synchronous courses that employ a variety of interactive pedagogical techniques, and that students overwhelmingly suggest behavioral and pedagogical changes that increase social engagement and interaction. We argue that these results support the importance of active learning in an online environment.

MATERIALS AND METHODS

Participant Pool

Students were recruited through the Instagram account @unjadedjade. This social media platform, run by influencer Jade Bowler, focuses on education, effective study tips, ethical lifestyle, and promotes a positive mindset. For this reason, the audience is presumably academically inclined, and interested in self-improvement. The survey was posted to her account and received 10,563 responses within the first 36 h. Here we analyze the 4,789 of those responses that came from undergraduates. While we did not collect demographic or identifying information, we suspect that women are overrepresented in these data as followers of @unjadedjade are 80% women. A large minority of respondents were from the United Kingdom as Jade Bowler is a British influencer. Specifically, 43.3% of participants attend United Kingdom institutions, followed by 6.7% attending university in the Netherlands, 6.1% in Germany, 5.8% in the United States and 4.2% in Australia. Ninety additional countries are represented in these data (see **Supplementary Figure 1**).

Survey Design

The purpose of this survey is to learn about students' instructional experiences following the transition to remote learning in the spring of 2020.

This survey was initially created for a student assignment for the undergraduate course Empirical Analysis at Minerva Schools at KGI. That version served as a robust pre-test and allowed for identification of the primary online platforms used, and the four primary modes of learning: synchronous (live) classes, recorded lectures and videos, uploaded or emailed materials, and chat-based communication. We did not adapt any open-ended questions based on the pre-test survey to avoid biasing the results and only corrected language in questions for clarity. We used these data along with an analysis of common practices in online learning to revise the survey. Our revised survey asked students to identify the synchronous and asynchronous pedagogical methods and platforms that they were using for remote learning. Pedagogical methods were drawn from literature assessing active and passive teaching strategies in North American institutions (Fink, 2013; Chen et al., 2018; Davis et al., 2018). Open-ended questions asked students to describe why they preferred certain modes of learning and how they could improve their learning experience. Students also reported on their affective response to learning and participation using a Likert scale.

The revised survey also asked whether students had responded to the earlier survey. No significant differences were found between responses of those answering for the first and second times (data not shown). See **Supplementary Appendix 1** for survey questions. Survey data was collected from 5/21/20 to 5/23/20.

Qualitative Coding

We applied a qualitative coding framework adapted from Gale et al. (2013) to analyze student responses to open-ended questions. Four researchers read several hundred responses and noted themes that surfaced. We then developed a list of themes inductively from the survey data and deductively from the literature on pedagogical practice (Garrison et al., 1999; Zull, 2002; Fink, 2013; Freeman et al., 2014). The initial codebook was revised collaboratively based on feedback from researchers after coding 20–80 qualitative comments each. Before coding their assigned questions, alignment was examined through coding of 20 additional responses. Researchers aligned in identifying the same major themes. Discrepancies in terms identified were resolved through discussion. Researchers continued to meet weekly to discuss progress and alignment. The majority of responses were coded by a single researcher using the final codebook (**Supplementary Table 1**). All responses to questions 3 (4,318 responses) and 8 (4,704 responses), and 2,512 of 4,776 responses to question 12 were analyzed. Valence was also indicated where necessary (i.e., positive or negative discussion of terms). This paper focuses on the most prevalent themes from our initial analysis of the qualitative responses. The corresponding author reviewed codes to ensure consistency and accuracy of reported data.

Statistical Analysis

The survey included two sets of Likert-scale questions, one consisting of a set of six statements about students' perceptions of their experiences following the transition to remote learning (**Table 1**). For each statement, students indicated their level of agreement with the statement on a five-point scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). The second set asked the students to respond to the same set of statements, but about their retroactive perceptions of their experiences with in-person instruction before the transition to remote learning. This set was not the subject of our analysis but is present in the published survey results. To explore correlations among student responses, we used CrossCat analysis to calculate the probability of dependence between Likert-scale responses (Mansinghka et al., 2016).

Mean values are calculated based on the numerical scores associated with each response. Measures of statistical significance for comparisons between different subgroups of respondents were calculated using a two-sided Mann-Whitney U-test, and

p-values reported here are based on this test statistic. We report effect sizes in pairwise comparisons using the common-language effect size, f, which is the probability that the response from a random sample from subgroup 1 is greater than the response from a random sample from subgroup 2. We also examined the effects of different modes of remote learning and technological platforms using ordinal logistic regression. With the exception of the mean values, all of these analyses treat Likert-scale responses as ordinal-scale, rather than interval-scale data.

RESULTS

Students Prefer Synchronous Class Sessions

Students were asked to identify their primary mode of learning given four categories of remote course design that emerged from the pilot survey and across literature on online teaching: live (synchronous) classes, recorded lectures and videos, emailed or uploaded materials, and chats and discussion forums. While 42.7% ($n = 2,045$) students identified live classes as their primary mode of learning, 54.6% ($n = 2613$) students preferred this mode (**Figure 1**). Both recorded lectures and live classes were preferred over uploaded materials (6.22%, $n = 298$) and chat (3.36%, $n = 161$).

In addition to a preference for live classes, students whose primary mode was synchronous were more likely to enjoy the class, feel motivated and engaged, be satisfied with instruction and report higher levels of participation (**Table 2** and **Supplementary Figure 2**). Regardless of primary mode, over two-thirds of students reported they are often distracted during remote courses.

Variation in Pedagogical Techniques for Synchronous Classes Results in More Positive Perceptions of the Student Learning Experience

To survey the use of passive vs. active instructional methods, students reported the pedagogical techniques used in their live classes. Among the synchronous methods, we identify three different categories (National Research Council, 2000; Freeman et al., 2014). Passive methods (P) include lectures, presentations, and explanation using diagrams, white boards and/or other media. These methods all rely on instructor delivery rather than student participation. Our next category represents active learning through primarily one-on-one interactions (A). The methods in this group are in-class assessment, question-and-answer (Q&A), and classroom chat. Group interactions (F) included classroom discussions and small-group activities. Given these categories, Mann-Whitney U pairwise comparisons between the 7 possible combinations and Likert scale responses about student experience showed that the use of a variety of methods resulted in higher ratings of experience vs. the use of a single method whether or not that single method was active or passive (**Table 3**). Indeed, students whose classes used methods from each category (PAF) had higher ratings of enjoyment,

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TABLE 1 | Likert-scale questions.

Experience	Statements
Enjoyment	I enjoy having courses online
Motivation	I feel motivated to learn
Satisfaction	I feel satisfied with the instruction of my online courses
Engagement	My courses are engaging
Distraction	I am often distracted when doing coursework/attending classes
Active participation	I often ask questions, comment, and/or join discussions (either live, in chat or through email).

FIGURE 1 | Actual **(A)** and preferred **(B)** primary modes of learning.
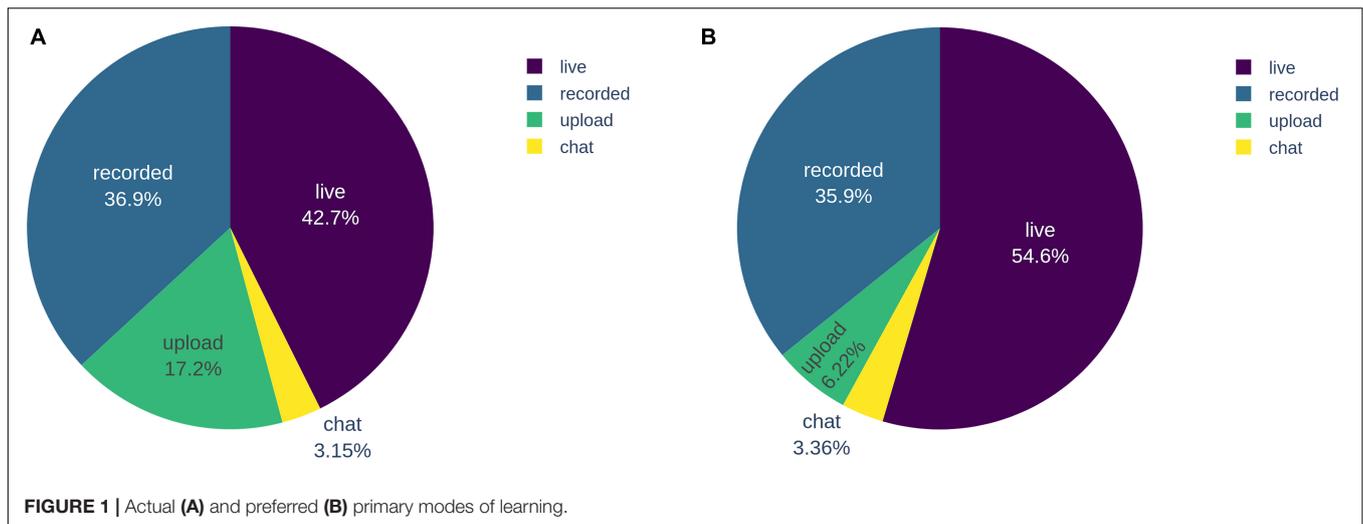
TABLE 2 | The effect of synchronous vs. asynchronous primary modes of learning on student perceptions.

Experience	Synchronous median (n = 2045)	Asynchronous median (n = 2744)	Cohen's d	Effect size (f)	P-value (p)
Enjoyment	3.0	2.0	0.186	0.554	$p < 0.0001$
Motivation	2.0	2.0	0.225	0.564	$p < 0.0001$
Satisfaction	3.0	2.0	0.418	0.614	$p < 0.0001$
Engagement	3.0	3.0	0.25	0.569	$p < 0.0001$
Distraction	4.0	4.0	−0.0103	0.505	N.S.
Participation	3.0	2.0	0.365	0.601	$p < 0.0001$

motivation, and satisfaction with instruction than those who only chose any single method ($p < 0.0001$) and also rated higher rates of participation and engagement compared to students whose only method was passive (P) or active through one-on-one interactions (A) ($p < 0.00001$). Student ratings of distraction were not significantly different for any comparison. Given that sets of Likert responses often appeared significant together in these comparisons, we ran a CrossCat analysis to look at the probability of dependence across Likert responses. Responses have a high probability of dependence on each other, limiting what we can claim about any discrete response (**Supplementary Figure 3**).

Mann-Whitney U pairwise comparisons were also used to check if improvement in student experience was associated with the number of methods used vs. the variety of types of methods. For every comparison, we found that more methods resulted in higher scores on all Likert measures except distraction (**Table 4**). Even comparison between four or fewer methods and greater than four methods resulted in a 59% chance that the latter enjoyed the courses more ($p < 0.00001$) and 60% chance that they felt more motivated to learn ($p < 0.00001$). Students who selected more than four methods ($n = 417$) were also 65.1% ($p < 0.00001$), 62.9% ($p < 0.00001$) and 64.3% ($p < 0.00001$) more satisfied with instruction, engaged, and actively participating, respectfully. Therefore, there was an overlap between how the number and variety of methods influenced students' experiences. Since the number of techniques per category is 2–3, we cannot fully disentangle the effect of number vs. variety. Pairwise comparisons to look at subsets of data with 2–3 methods from a single group

vs. 2–3 methods across groups controlled for this but had low sample numbers in most groups and resulted in no significant findings (data not shown). Therefore, from the data we have in our survey, there seems to be an interdependence between number and variety of methods on students' learning experiences.

Variation in Asynchronous Pedagogical Techniques Results in More Positive Perceptions of the Student Learning Experience

Along with synchronous pedagogical methods, students reported the asynchronous methods that were used for their classes. We divided these methods into three main categories and conducted pairwise comparisons. Learning methods include video lectures, video content, and posted study materials. Interacting methods include discussion/chat forums, live office hours, and email Q&A with professors. Testing methods include assignments and exams. Our results again show the importance of variety in students' perceptions (**Table 5**). For example, compared to providing learning materials only, providing learning materials, interaction, and testing improved enjoyment ($f = 0.546$, $p < 0.001$), motivation ($f = 0.553$, $p < 0.0001$), satisfaction with instruction ($f = 0.596$, $p < 0.00001$), engagement ($f = 0.572$, $p < 0.00001$) and active participation ($f = 0.563$, $p < 0.00001$) (row 6). Similarly, compared to just being interactive with conversations, the combination of all three methods improved five out of six indicators, except for distraction in class (row 11).

TABLE 3 | Comparison of combinations of synchronous methods on student perceptions. Effect size (f).

Comparison	Enjoyment	Motivation	Satisfaction	Engagement	Distraction	Participation
A vs. P	0.522	0.506	0.526	0.54	0.484	0.538
F vs. P	0.498	0.481	0.532	0.585*	0.519	0.63***
PA vs. P	0.548*	0.54	0.587***	0.58***	0.518	0.549*
PF vs. P	0.543	0.545	0.602***	0.622***	0.505	0.604***
AF vs. P	0.504	0.515	0.582**	0.609***	0.509	0.621***
PAF vs. P	0.592***	0.59***	0.661***	0.662***	0.49	0.665***
F vs. A	0.474	0.475	0.508	0.544	0.535	0.539*
PA vs. A	0.527	0.534	0.561	0.537	0.533	0.512
PF vs. A	0.522	0.539	0.574*	0.578*	0.521	0.566
AF vs. A	0.48	0.51	0.556	0.566	0.525	0.585*
PAF vs. A	0.574**	0.586***	0.636***	0.619***	0.505	0.627***
PA vs. F	0.553	0.558	0.551	0.489	0.499	0.418*
PF vs. F	0.548	0.563	0.565	0.529	0.486	0.47
AF vs. F	0.507	0.534	0.547	0.519	0.489	0.494
PAF vs. F	0.6**	0.606***	0.625***	0.573	0.472	0.533
PF vs. PA	0.495	0.505	0.512	0.543	0.487	0.554
AF vs. PA	0.452	0.475	0.494	0.531	0.491	0.573*
PAF vs. PA	0.545*	0.552**	0.579***	0.589***	0.473	0.615***
AF vs. PF	0.458	0.47	0.481	0.489	0.503	0.522
PAF vs. PF	0.551	0.549	0.57**	0.549	0.485	0.564**
PAF vs. AF	0.597***	0.576*	0.587**	0.558	0.482	0.538

*p = 0.001, **p = 0.0001, ***p = 0.00001.
P (n = 759), passive methods; A (n = 311), 1-on-1 interactions; F (n = 174), group interactions; PA (n = 835), combination of passive and 1-on-1 interactions; PF (n = 410), combination of passive and group interactions; AF (n = 235), combination of 1-on-1 interactions and group interactions; PAF (n = 1103), combination of passive, 1-on-1 interactions, and group interactions.

TABLE 4 | Comparison of the number of synchronous methods on student perceptions. Effect size (f).

Number of methods in class(# of responses)	Enjoyment	Motivation	Satisfaction	Engagement	Distraction	Participation
>1 (2,769) vs.1 (1,093)	0.568***	0.574***	0.613***	0.595***	0.511	0.597***
>2 (1,744) vs. 1, 2 (2,118)	0.578***	0.582***	0.621***	0.607***	0.498	0.603***
>3 (934) vs. 1, 2, 3 (2,928)	0.592***	0.586***	0.625***	0.621***	0.476	0.624***
>4 (417) vs. 1, 2, 3, 4 (3,445)	0.591***	0.597***	0.651***	0.629***	0.475	0.643***

*p = 0.001, **p = 0.0001, ***p = 0.00001.

Ordinal logistic regression was used to assess the likelihood that the platforms students used predicted student perceptions (**Supplementary Table 2**). Platform choices were based on the answers to open-ended questions in the pre-test survey. The synchronous and asynchronous methods used were consistently more predictive of Likert responses than the specific platforms. Likewise, distraction continued to be our outlier with no differences across methods or platforms.

Students Prefer In-Person and Synchronous Online Learning Largely Due to Social-Emotional Reasoning

As expected, 86.1% (4,123) of survey participants report a preference for in-person courses, while 13.9% (666) prefer online courses. When asked to explain the reasons for their preference, students who prefer in-person courses most often mention the importance of social interaction (693 mentions), engagement (639 mentions), and motivation (440 mentions). These students are also more likely to mention a preference for a fixed schedule (185 mentions) vs. a flexible schedule (2 mentions).

In addition to identifying social reasons for their preference for in-person learning, students' suggestions for improvements in online learning focus primarily on increasing interaction and engagement, with 845 mentions of live classes, 685 mentions of interaction, 126 calls for increased participation and calls for changes related to these topics such as, "Smaller teaching groups for live sessions so that everyone is encouraged to talk as some people don't say anything and don't participate in group work," and "Make it less of the professor reading the pdf that was given to us and more interaction."

Students who prefer online learning primarily identify independence and flexibility (214 mentions) and reasons related to anxiety and discomfort in in-person settings (41 mentions). Anxiety was only mentioned 12 times in the much larger group that prefers in-person learning.

The preference for synchronous vs. asynchronous modes of learning follows similar trends (**Table 6**). Students who prefer

TABLE 5 | Comparison of combinations of asynchronous methods on student perceptions. Effect size (f).

Comparison	Enjoyment	Motivation	Satisfaction	Engagement	Distraction	Participation
I vs. L	0.467	0.457	0.463	0.455	0.495	0.482
T vs. L	0.47	0.481	0.446	0.459	0.479	0.466
LI vs. L	0.536	0.525	0.561**	0.539	0.466	0.529
LT vs. L	0.527	0.529	0.534	0.508	0.504	0.563**
IT vs. L	0.492	0.471	0.527	0.51	0.515	0.534
LIT vs. L	0.546*	0.553**	0.596***	0.572***	0.496	0.563***
T vs. I	0.502	0.521	0.485	0.506	0.484	0.484
LI vs. I	0.57***	0.569***	0.595***	0.584***	0.471	0.547
LT vs. I	0.56*	0.572***	0.568**	0.554*	0.51	0.58***
IT vs. I	0.525	0.513	0.562	0.555	0.521	0.551
LIT vs. I	0.58***	0.596***	0.627***	0.617***	0.501	0.58***
LI vs. T	0.567	0.544	0.614***	0.582*	0.486	0.564
LT vs. T	0.557	0.547	0.586*	0.551	0.526	0.599**
IT vs. T	0.522	0.491	0.58	0.55	0.538	0.567
LIT vs. T	0.577*	0.569	0.647***	0.618***	0.517	0.598**
LT vs. LI	0.491	0.504	0.472	0.468	0.539	0.535
IT vs. LI	0.456	0.446	0.466	0.47	0.552	0.505
LIT vs. LI	0.511	0.528	0.535	0.534	0.53	0.535
IT vs. LT	0.465	0.442	0.494	0.501	0.511	0.472
LIT vs. LT	0.52	0.524	0.563***	0.567***	0.491	0.5
LIT vs. IT	0.555	0.582*	0.568	0.563	0.48	0.528

*p = 0.001, **p = 0.0001, ***p = 0.00001.
L (n = 583), learning methods; I (n = 569), interacting methods; T (n = 166), testing methods; LI (n = 891), combination of learning and interacting methods; LT (n = 638), combination of learning and testing methods; IT (n = 191), combination of interacting and testing methods; LIT (n = 1685), combination of learning, interacting and testing methods.

TABLE 6 | Most prevalent themes for students based on their preferred mode of remote learning.

Preferred mode (# of responses)	Engagement	Interaction	Flexibility	Fixed schedule	Familiarity
Discussion forums/chats (161)	8	70	10	3	2
Live classes (2613)	182	1304	4	241	320
Recorded lectures (1,717)	33	9	1150	0	55
Uploaded or emailed Materials (298)	13	1	150	0	5

live classes mention engagement and interaction most often while those who prefer recorded lectures mention flexibility.

DISCUSSION

Student Perceptions Align With Research on Active Learning

The first, and most robust, conclusion is that incorporation of active-learning methods correlates with more positive student perceptions of affect and engagement. We can see this clearly in the substantial differences on a number of measures, where students whose classes used only passive-learning techniques reported lower levels of engagement, satisfaction, participation, and motivation when compared with students whose classes incorporated at least some active-learning elements. This result is consistent with prior research on the value of active learning (Freeman et al., 2014).

Though research shows that student learning improves in active learning classes, on campus, student perceptions of their learning, enjoyment, and satisfaction with instruction are often lower in active-learning courses (Deslauriers et al., 2019). Our finding that students rate enjoyment and satisfaction with instruction higher for active learning online suggests that the preference for passive lectures on campus relies on elements outside of the lecture itself. That might include the lecture hall environment, the social physical presence of peers, or normalization of passive lectures as the expected mode for on-campus classes. This implies that there may be more buy-in for active learning online vs. in-person.

A second result from our survey is that student perceptions of affect and engagement are associated with students experiencing a greater diversity of learning modalities. We see this in two different results. First, in addition to the fact that classes that include active learning outperform classes that rely solely on passive methods, we find that on all measures besides distraction, the highest student ratings are associated with a combination of

active and passive methods. Second, we find that these higher scores are associated with classes that make use of a larger number of different methods.

This second result suggests that students benefit from classes that make use of multiple different techniques, possibly invoking a combination of passive and active methods. However, it is unclear from our data whether this effect is associated specifically with combining active and passive methods, or if it is associated simply with the use of multiple different methods, irrespective of whether those methods are active, passive, or some combination. The problem is that the number of methods used is confounded with the diversity of methods (e.g., it is impossible for a classroom using only one method to use both active and passive methods). In an attempt to address this question, we looked separately at the effect of number and diversity of methods while holding the other constant. Across a large number of such comparisons, we found few statistically significant differences, which may be a consequence of the fact that each comparison focused on a small subset of the data.

Thus, our data suggests that using a greater diversity of learning methods in the classroom may lead to better student outcomes. This is supported by research on student attention span which suggests varying delivery after 10–15 min to retain student's attention (Bradbury, 2016). It is likely that this is more relevant for online learning where students report high levels of distraction across methods, modalities, and platforms. Given that number and variety are key, and there are few passive learning methods, we can assume that some combination of methods that includes active learning improves student experience. However, it is not clear whether we should predict that this benefit would come simply from increasing the number of different methods used, or if there are benefits specific to combining particular methods. Disentangling these effects would be an interesting avenue for future research.

Students Value Social Presence in Remote Learning

Student responses across our open-ended survey questions show a striking difference in reasons for their preferences compared with traditional online learners who prefer flexibility (Harris and Martin, 2012; Levitz, 2016). Students reasons for preferring in-person classes and synchronous remote classes emphasize the desire for social interaction and echo the research on the importance of social presence for learning in online courses.

Short et al. (1976) outlined Social Presence Theory in depicting students' perceptions of each other as real in different means of telecommunications. These ideas translate directly to questions surrounding online education and pedagogy in regards to educational design in networked learning where connection across learners and instructors improves learning outcomes especially with "Human-Human interaction" (Goodyear, 2002, 2005; Tu, 2002). These ideas play heavily into asynchronous vs. synchronous learning, where Tu reports students having positive responses to both synchronous "real-time discussion in pleasantness, responsiveness and comfort with familiar topics" and real-time discussions edging out asynchronous

computer-mediated communications in immediate replies and responsiveness. Tu's research indicates that students perceive more interaction with synchronous mediums such as discussions because of immediacy which enhances social presence and support the use of active learning techniques (Gunawardena, 1995; Tu, 2002). Thus, verbal immediacy and communities with face-to-face interactions, such as those in synchronous learning classrooms, lessen the psychological distance of communicators online and can simultaneously improve instructional satisfaction and reported learning (Gunawardena and Zittle, 1997; Richardson and Swan, 2019; Shea et al., 2019). While synchronous learning may not be ideal for traditional online students and a subset of our participants, this research suggests that non-traditional online learners are more likely to appreciate the value of social presence.

Social presence also connects to the importance of social connections in learning. Too often, current systems of education emphasize course content in narrow ways that fail to embrace the full humanity of students and instructors (Gay, 2000). With the COVID-19 pandemic leading to further social isolation for many students, the importance of social presence in courses, including live interactions that build social connections with classmates and with instructors, may be increased.

Limitations of These Data

Our undergraduate data consisted of 4,789 responses from 95 different countries, an unprecedented global scale for research on online learning. However, since respondents were followers of @unjadedjade who focuses on learning and wellness, these respondents may not represent the average student. Biases in survey responses are often limited by their recruitment techniques and our bias likely resulted in more robust and thoughtful responses to free-response questions and may have influenced the preference for synchronous classes. It is unlikely that it changed students reporting on remote learning pedagogical methods since those are out of student control.

Though we surveyed a global population, our design was rooted in literature assessing pedagogy in North American institutions. Therefore, our survey may not represent a global array of teaching practices.

This survey was sent out during the initial phase of emergency remote learning for most countries. This has two important implications. First, perceptions of remote learning may be clouded by complications of the pandemic which has increased social, mental, and financial stresses globally. Future research could disaggregate the impact of the pandemic from students' learning experiences with a more detailed and holistic analysis of the impact of the pandemic on students.

Second, instructors, students and institutions were not able to fully prepare for effective remote education in terms of infrastructure, mentality, curriculum building, and pedagogy. Therefore, student experiences reflect this emergency transition. Single-modality courses may correlate with instructors who lacked the resources or time to learn or integrate more than one modality. Regardless, the main insights of this research align well with the science of teaching and learning and can be used to inform both education during future emergencies and course

development for online programs that wish to attract traditional college students.

Global Student Voices Improve Our Understanding of the Experience of Emergency Remote Learning

Our survey shows that global student perspectives on remote learning agree with pedagogical best practices, breaking with the often-found negative reactions of students to these practices in traditional classrooms (Shekhar et al., 2020). Our analysis of open-ended questions and preferences show that a majority of students prefer pedagogical approaches that promote both active learning and social interaction. These results can serve as a guide to instructors as they design online classes, especially for students whose first choice may be in-person learning. Indeed, with the near ubiquitous adoption of remote learning during the COVID-19 pandemic, remote learning may be the default for colleges during temporary emergencies. This has already been used at the K-12 level as snow days become virtual learning days (Aspergren, 2020).

In addition to informing pedagogical decisions, the results of this survey can be used to inform future research. Although we survey a global population, our recruitment method selected for students who are English speakers, likely majority female, and have an interest in self-improvement. Repeating this study with a more diverse and representative sample of university students could improve the generalizability of our findings. While the use of a variety of pedagogical methods is better than a single method, more research is needed to determine what the optimal combinations and implementations are for courses in different disciplines. Though we identified social presence as the major trend in student responses, the over 12,000 open-ended responses from students could be analyzed in greater detail to gain a more nuanced understanding of student preferences and suggestions for improvement. Likewise, outliers could shed light on the diversity of student perspectives that we may encounter in our own classrooms. Beyond this, our findings can inform research that collects demographic data and/or measures learning outcomes to understand the impact of remote learning on different populations.

Importantly, this paper focuses on a subset of responses from the full data set which includes 10,563 students from secondary school, undergraduate, graduate, or professional school and additional questions about in-person learning. Our full data set is available here for anyone to download for continued exploration: https://dataverse.harvard.edu/dataset. xhtml?persistentId=doi:10.7910/DVN/2TGOPH.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

GS: project lead, survey design, qualitative coding, writing, review, and editing. TN: data analysis, writing, review, and editing. CN and PB: qualitative coding. JW: data analysis, writing, and editing. CS: writing, review, and editing. EV and KL: original survey design and qualitative coding. PP: data analysis. JB: original survey design and survey distribution. HH: data analysis. MP: writing. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc. 2021.647986/full#supplementary-material

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The Psychological and Academic Effects of Studying From the Home and Host Country During the COVID-19 Pandemic

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Objective: This study explored the psychological and academic effects of studying online from the home vis-à-vis host country during the coronavirus disease 2019 (COVID-19) pandemic in the experience of international students at the University of Warsaw, Poland.

Methods: A total of 357 international students from 62 countries (236 in the host country and 121 in the home country) completed an online questionnaire survey 2 months after transition to online learning. We studied students' levels of loneliness, life and academic satisfaction, acculturative stress, academic adjustment, performance, loyalty, and perceptions of the online learning experience.

Results: The country-of-residence variable had no statistically significant effects on most psychological and academic variables. Significant effects were observed only for two academic variables. Specifically, students who returned to the home country found online communication with other students more contributing to their online learning experience and exhibited higher academic adjustment than students who remained in the host country. This suggests the positive influence of (peer and familial) support on online learning experience from the home country. Furthermore, a significant difference in experiencing acculturative stress occurred for students in quarantine/self-isolation in the host country, which expands prior literature on the disruptive effects of social distancing on students' mental health. Finally, this study confirmed the expected increased levels of loneliness among self-isolating students in both countries, hence extending prior results to the home- and host-country contexts. No relationship between self-isolation and students' life or academic satisfaction was found, which is explained by the specific nature of the learning-from-home experience.

Keywords: COVID-19, quarantine, international students (foreign students), online learning, satisfaction, academic adjustment, acculturative stress, loneliness

INTRODUCTION

The emergence of the new coronavirus disease 2019 (COVID-19) in December 2019 in Wuhan, China, and a global outbreak of the COVID-19 pandemic in March 2020 have resulted in an unprecedented lockdown of national economies and social distancing restrictions, which had far-reaching economic, political, and social (Bretas and Alon, 2020; Nicola et al., 2020) but also educational consequences. The nationwide closures of educational institutions in 143 countries (UNESCO, 2020) have led to the transition from the conventional to the online learning mode, which dramatically changed studying and working patterns (de Haas et al., 2020).

Although studies show positive working-from-home experiences (e.g., Dubey and Tripathi, 2020), students' experience is generally described as disrupted and leading to feelings of insecurity, anxiety, and hopelessness (Hajdúk et al., 2020; Wang and Zhao, 2020). Students express concerns about economic implications for society, health implications for their families and society, and their own educational and career plans (Cohen et al., 2020). Studies present the pandemic as a disruptive event causing stress that negatively affects students' learning performance and psychological well-being. For example, studies show such adverse effects of lockdowns as increased levels of students' social avoidance (Al-Rabiaah et al., 2020), anxiety (Kaparounaki et al., 2020; Kapasiaa et al., 2020), and a decreased quality of general life (Kaparounaki et al., 2020). Moreover, self-isolating college students suffer from physical and mental health problems (e.g., insomnia, depression) more than those who do not self-isolate (Tang et al., 2020; Zhao et al., 2020; Zhou et al., 2020).

In terms of study experience, students are often dissatisfied with remote learning, as they miss interactions with peers and teachers (de Haas et al., 2020). They perceive their academic experience as difficult and worse than before the pandemic due to the chaotic organization of online learning and a lower quality of online classes as compared to traditional ones (Wilczewski et al., 2020). Moreover, a lack of Internet infrastructure in some underdeveloped locations or unfavorable study conditions in the household prevents students from full engagement in online learning (Kapasiaa et al., 2020).

As compared to domestic students, the negative social and psychological outcomes of the coronavirus outbreak may be more severe for international students who, even in normal conditions, are more prone to mental health problems and do not seek psychological help in the host country (Alharbi and Smith, 2018; Chen et al., 2020). Relocation to another country, leaving family and friends in the home country, entails stress-provoking changes that draw on an individual's coping responses and adjustive resources, which is explained by the stress-and-coping approach to cross-cultural transition (Ward, 2004). Among the stressors that influence students' adjustment and cross-cultural transition are not only situational factors, such as the characteristics of the host country, but also more dynamic factors like the ongoing coronavirus pandemic. As predicted by psychologists, the pandemic-related health crisis and host nationals' fear of the virus led to international students' social exclusion, xenophobic reactions, and an increase in ethnicity and culture-based discrimination (Cohen et al., 2020), especially toward those of Asian background (Rzymski and Nowicki, 2020), which are detrimental to students' mental health, sense of belonging, and self-esteem (King et al., 2020). In turn, the feeling of being perceived negatively by host nationals may affect students' psychological health and hamper their cross-cultural transition, which is reflected in cultural adjustment models (e.g., Kim, 2001). While the negative effects of acculturative stress (e.g., perceived discrimination and communication barrier) decrease the quality of academic experience, adjustment, and mental health (Tummala-Narra et al., 2012), perceived social support mitigates those effects (Ward, 2004; Cura and Işik, 2016; Shu et al., 2020).

The disrupted experience in the host country and campus closures have pushed many international students to travel back to their home country to seek family support. In the USA only, over one million international students returned home in spring 2020 (Dennis, 2020). However, some students had to continue studying in the host country due to closed borders and travel restrictions (Sahu, 2020), being devoid of family and social support structures (Chen et al., 2020).

Despite a growing literature on the disruptive social and emotional outcomes of social distancing and self-isolation on students' psychological well-being, little is known about the impact of the host- and home-country context on the academic experience of international students. Responding to the latest calls for exploring the effects of university closures on students' experiences (Nicola et al., 2020), we will address the following research question: *Is there a difference between international students studying from the home country and those studying from the host country with respect to the psychological and academic effects of online learning during the COVID-19 pandemic?*

Accordingly, this research aimed to explore the psychological and academic effects of studying from the home and host country during the COVID-19 pandemic, based on the experience of international students in the University of Warsaw (UW), Poland; UW is the top 1 and largest Polish and Central European university that switched most teaching activities to online mode in mid-March 2020. Based on prior research on mental health issues of international students and the positive role of social support in their experience in the host country, we assumed that students who participated in online learning from the home country should have better access to support structures (e.g., family, friends) than their counterparts in the host country. Therefore, in such a disruptive experience as learning from home during the pandemic, we hypothesized:

Hypotheses 1a–c: Students in the home country show overall (1a) more satisfactory life and (1b) more satisfactory academic experience, as well as (1c) lower perceived discrimination and communication stress than students in the host country.

Moreover, based on prior research on the negative impact of social distancing on students' mental health, it is tentatively hypothesized that, regardless of the country of residence,

Hypotheses 2a–d: Students in self-isolation experience (2a) higher perceived acculturative stress, (2b) higher levels of

loneliness, (2c) lower life satisfaction, and (2d) lower academic satisfaction than students who do not self-isolate.

METHOD

Research Design

To test the above hypotheses and answer the research question, we conducted a quantitative study that compared the levels of several psychological and academic factors in two groups of international students.

Sample

As shown in **Table 1**, 357 international students participated in the research, which comprises 6.5% of all international students at UW. They originated from 62 countries, with the majority coming from Ukraine (21.8%), Belarus (18.7%), China, Spain (5.5% each), Italy (5%), Turkey (4.2%), Russia (2.9%), France (2.4%), and others (under 2%). The number of students who stayed in the host country was nearly twice the number of students who returned home. The majority of participants were female, with gender distribution relatively similar for the host country (female/male = 2.05/1) and home country (female/male = 2.45/1). In both locations, most participants were long-term students, mostly in BA and MA programs. Students in the host country were slightly older as they had an average age of 23.39 years (SD = 4.99) as compared to students who returned home, with an average age of 21.88 years (SD = 4.17). This may be explained by a higher number of MA and Ph.D. students in the host country. Around 60% of students stayed in quarantine or self-isolation when completing the survey. The instruction specified that staying in quarantine/self-isolation referred to "staying at home, going out only for shopping groceries and medicine, medical needs, providing care or help to a vulnerable person, traveling to and from work (where working from home is not possible)."

Procedure

We collected quantitative data from international students recruited through an email invitation sent out to the whole population of international students at UW (5,500 students) from the university's Welcome Point UW office. Participation was voluntary, and no remuneration was provided. We asked participants to complete an anonymous online questionnaire concerning their online learning experience at UW during the coronavirus pandemic. Apart from the English-language version of the survey, we prepared a Polish version so that international students from Eastern European countries who had a better command of Polish than English could also participate in the study. We back-translated (Brislin, 1970) all scales that have no validated Polish versions in the literature. Because all UW foreign students have a command of English (in international programs) or Polish (in Polish-taught programs) at least at the B2 level, which is verified in the admission process, their language proficiency was sufficient for understanding the questionnaire. In our sample, 126 students (35.3%) chose the Polish version. After giving written consent, they completed the survey over 10 days

TABLE 1 | Participants' characteristics (N = 357).

Background variables	Students in host country (Poland) (N = 236)	Students in home country (N = 121)
Gender		
• Male	77 (32.6%)	35 (28.94%)
• Female	158 (66.9%)	86 (71.1%)
• Other	1 (0.4%)	0
Type of student		
• Long-term	132 (55.9%)	84 (69.4%)
• Short-term (e.g., Erasmus)	104 (44.1%)	37 (33.3%)
Program[a]		
• BA	133 (55.6%)	87 (71.9%)
• MA	85 (36.0%)	29 (24.0%)
• Doctoral	16 (6.8%)	3 (2.5%)
• Other	6 (2.5%)	3 (2.5%)
Staying in quarantine/self-isolation		
• Yes	145 (61.4%)	72 (59.5%)
• No	91 (38.6%)	49 (40.5%)

[a]Percentage totals for the program are higher than 100% as some students attended different programs at the same time.

at the turn of May and June 2020 during the lockdown period in Poland. It took them ~15 min.

Measures

Social and Emotional Loneliness

Students completed the 11-item De Jong Gierveld Loneliness Scale (DJGLS) (de Jong-Gierveld and van Tilburg, 1999) or its Polish adaptation by Grygiel et al. (2013). The scale measures *social loneliness* with five items (e.g., "I can call on my friends whenever I need them;" $\alpha = 0.75/0.82$ for English/Polish version) and *emotional loneliness* with six items (e.g., "I miss the pleasure of the company of others;" $\alpha = 0.79/0.83$ for English/Polish version), rated on a 5-point scale (1 = absolutely yes, 5 = absolutely no).

Life and Academic Satisfaction

Students rated their satisfaction with general life and academic satisfaction using a 7-point scale (1 = strongly disagree, 7 = strongly agree). They completed the 5-item Satisfaction with Life Scale (SWLS) (Diener et al., 1985) or its Polish adaptation by Jankowski (2015). *Life satisfaction* measures the perception of the general well-being (e.g., "In most ways my life is close to my ideal;" $\alpha = 0.79/0.83$ for English/Polish version). *Academic satisfaction* was measured with six items capturing satisfaction with (1) general academic experience, (2) studying in the university during the pandemic, (3) studying conditions, (4) online learning in the university, (5) self-perceived scholarly development, and (6) achievement in online learning. Those components constituted a one-factor scale ($\alpha = 0.83/0.82$ for English/Polish version).

Acculturative Stress

Students completed two subscales of the Acculturative Stress Scale (Bashir and Khalid, 2020), rating items on a 5-point scale (1 = strongly disagree, 5 = strongly agree). The first subscale measures *discrimination stress* (i.e., a feeling of unfair treatment) on the grounds of one's international student status, ethnicity, and gender (three items, e.g., "I feel that because I'm a foreign student I'm denied the privileges enjoyed by the local students here;" $\alpha = 0.68/0.72$ for English/Polish version). The second subscale measures *communication stress* (three items, e.g., "I feel difficulty communicating with local people due to the language barrier;" $\alpha = 0.75/0.72$ for English/Polish version).

Online Learning Experience, Academic Adjustment, Performance, and Loyalty

All academic variables were measured using a 7-point scale (1 = strongly disagree, 7 = strongly agree). The online learning experience was captured with a self-developed 12-item scale measuring four aspects (3 items per scale) of online learning: (1) *interactions with students* (e.g., "Communication with other students has had a positive effect on my online learning experience;" $\alpha = 0.75/0.72$ for English/Polish version); (2) *interactions with teachers* (e.g., "I find my teachers supportive in my online learning;" $\alpha = 0.78/0.80$ for English/Polish version); (3) *technical capacity* (e.g., "I have enough technical ability to participate in online classes;" $\alpha = 0.76/0.66$ for English/Polish version); and (4) *organization of online learning* (e.g., "My university organizes online learning well;" $\alpha = 0.81/0.75$ for English/Polish version).

Academic adjustment (i.e., the degree to which a student fits in the academic context and how comfortable they feel in that context) was measured with five items expressing adjustment to (1) teaching methods, (2) student assessment methods, (3) teachers' expectations toward students, (4) studying conditions, and (5) online learning. The scale yielded a one-factor structure ($\alpha = 0.83$ for both English and Polish version).

Academic performance and *student loyalty* were measured with one item per variable, respectively, "My academic performance is better in online learning than before the COVID-19 pandemic" and "I would not recommend online learning experience in this university to other students" (reverse coded), similarly to prior studies (e.g., van Rooij et al., 2018).

Control Variables

We included *age* and *personality traits* as control variables (see **Table 2**) to check potential differences between students in the host and home country. Students completed the Ten-Item Personality Inventory (TIPI) (Gosling et al., 2003), which measures the Big Five dimensions; a Polish version developed by Sorokowska et al. (2014) was used. Students rated, on a 7-point scale (1 = disagree strongly, 7 = agree strongly), the extent to which five pairs of traits applied to them (e.g., "I see myself as extraverted, enthusiastic"). The traits involved (Cronbach's alpha for English/Polish version): extraversion (0.68/0.70), agreeableness (0.40/0.50), conscientiousness (0.50/0.76), emotional stability (0.73/0.65), and openness to experiences (0.45/0.47).

TABLE 2 | Age and personality differences between students staying in the host ($N = 236$) vs. home ($N = 121$) country.

Control variables	Country	M	SD	$t_{(356)}$
Age	Host	23.39	4.99	2.87**
	Home	21.88	4.17	
Personality traits				
• Extraversion	Host	4.66	1.46	−0.70
	Home	4.78	1.54	
• Agreeableness	Host	5.10	1.23	0.75
	Home	5.00	1.23	
• Conscientiousness	Host	5.27	1.44	−0.57
	Home	5.36	1.42	
• Emotional stability	Host	4.47	1.56	1.24
	Home	4.25	1.62	
• Openness to experiences	Host	5.17	1.20	−0.31
	Home	5.21	1.04	

$^{**}p < 0.01$.

Data Analysis

We performed descriptive statistics, *t*-test, and 1-ANCOVA to compare groups of students, applying age and personality traits as covariates (control variables). The sample allowed us to identify differences between the measured variables (see **Table 3**) between students in the host vs. home country with the effect size of at least Cohen's $d = 0.30$ and probability of $1 - \beta = 0.90$ for two-tailed tests and $1 - \beta = 0.80$ for one-tailed tests with significance at $\alpha = 0.05$.

RESULTS

First, we checked if students' decision making concerning turning back to the home country was related to their age or personality profile (see **Table 2**). The analysis showed statistically significant differences in age [$t(356) = 2.87, p < 0.01$] in that older students tended to stay in the host country. No significant differences between students in the host and home country were found for any personality trait within the Big Five model.

As shown in **Table 3**, statistically significant differences between students staying in the host and home country during the pandemic were found in their online communication with other students [$F(1, 349) = 5.57, p < 0.05$; Cohen's $d = 0.26$]. Students in the home country found online communication with other students more important in their online learning experience than those in the host country. Moreover, students in their home country showed higher academic adjustment than those in the host country [$F(1,364) = 4.01, p < 0.05$; Cohen's $d = 0.20$].

No country-related differences were found for experiencing acculturative stress, neither discrimination [$F(1, 349) = 2.39, p$ = n.s.] nor communication stress [$F(1, 349) = 0.36, p$ = n.s.]. However, students who stayed in self-isolation exhibited higher discrimination stress than their counterparts who did not self-isolate, both in the host country [$F(1, 228) = 9.14, p < 0.01$; Cohen's $d = 0.39$] and home country [$F(1, 113) = 4.49, p < 0.01$, Cohen's $d = 0.38$].

TABLE 3 | The effects of staying in the host ($N = 236$) vs. home ($N = 121$) country and staying vs. not staying in quarantine/self-isolation on international students' well-being and academic experience[a].

Variable		Staying in host country[b]			Staying in quarantine/self-isolation					
					Students in host country[c]			Students in home country[d]		
		M	SD	$F_{(1, 349)}$	M	SD	$F_{(1, 228)}$	M	SD	$F_{(1, 113)}$
Social loneliness	Yes	2.57	0.85	2.21	2.66	0.84	3.13[#]	2.52	0.88	2.47
	No	2.42	0.87		2.43	0.87		2.28	0.83	
Emotional loneliness	Yes	3.06	0.88	1.85	3.16	0.83	3.16[#]	3.04	0.91	3.37[#]
	No	2.94	0.91		2.90	0.94		2.78	0.89	
Life satisfaction	Yes	4.50	1.13	0.00	4.41	1.14	1.77	4.47	1.27	0.10
	No	4.49	1.30		4.64	1.11		4.51	1.37	
Academic satisfaction	Yes	4.45	1.22	0.44	4.46	1.22	0.00	4.46	1.17	0.21
	No	4.49	1.21		4.44	1.22		4.53	1.28	
Discrimination stress	Yes	2.06	0.78	2.39	2.19	0.79	9.14[##]	2.05	0.74	4.49[##]
	No	1.94	0.73		1.86	0.74		1.78	0.68	
Communication stress	Yes	2.99	1.13	0.36	3.09	1.09	1.74	2.88	1.08	2.38
	No	3.01	1.07		2.83	1.18		3.21	1.04	
Interactions with students	Yes	3.88	1.43	5.57*	3.88	1.43	0.04	4.33	1.37	0.26
	No	4.26	1.49		3.87	1.42		4.17	1.67	
Interactions with teachers	Yes	4.49	1.39	0.30	4.49	1.45	0.04	4.50	1.53	0.00
	No	4.50	1.52		4.49	1.31		4.50	1.52	
Student's technical capacity	Yes	5.79	1.20	1.09	5.77	1.31	0.00	5.61	1.14	0.09
	No	5.64	1.10		5.83	1.02		5.68	1.06	
Organization of learning	Yes	4.46	1.35	1.81	4.48	1.35	0.14	4.56	1.33	0.34
	No	4.61	1.34		4.42	1.35		4.69	1.36	
Academic adjustment	Yes	4.95	1.20	4.01*	4.94	1.18	0.02	5.09	1.09	0.96
	No	5.17	1.00		4.96	1.23		5.28	0.85	
Academic performance	Yes	3.09	1.66	0.17	3.14	1.68	0.22	3.10	1.67	0.48
	No	3.19	1.68		3.02	1.63		3.33	1.70	
Student loyalty	Yes	4.45	1.87	0.48	4.44	1.94	0.05	4.15	1.70	0.54
	No	4.24	1.91		4.46	1.77		4.37	2.21	

[a]Covariates: age and personality traits.
*$p < 0.05$ for two-tailed tests.
[#]$p < 0.05$, [##]$p < 0.01$ for one-tailed tests.
[b]Comparisons between students staying in the host (Yes) and home (No) country during the pandemic.
[c]Comparisons between students staying (Yes) and not staying (No) in quarantine/self-isolation in the host country during the pandemic.
[d]Comparisons between students staying (Yes) and not staying (No) in quarantine/self-isolation in the home country during the pandemic.

Finally, students in self-isolation in the host country showed higher social [$F(1, 228) = 3.13$, $p < 0.05$; Cohen's $d = 0.27$] and emotional loneliness [$F(1, 228) = 3.16$, $p < 0.05$; Cohen's $d = 0.29$] than their counterparts who did not self-isolate. The same direction of difference was found for students in quarantine/self-isolation in their home country for emotional loneliness [$F(1, 113) = 3.37$, $p < 0.05$; Cohen's $d = 0.29$].

No statistically significant differences were found for experiencing life and academic satisfaction for students in self-isolation and those who did not self-isolate (see **Table 3**).

DISCUSSION

The outbreak of the COVID-19 pandemic has caused an unprecedented health crisis that disrupted education institutions globally by pushing online activities to the online mode. Campus closures and social distancing measures introduced to stop the spread of the virus deprived students of the socializing aspect, negatively impacting their mental health. The pandemic experience was particularly challenging for international students who were devoid of adequate social support (family, friends) their domestic peers had. Furthermore, international students often struggled with immigration issues (Chirikov and Soria, 2020) and visa extension issues due to traveling restrictions (Hope, 2020; Wilczewski et al., 2020). In turn, those who managed to turn back to their home country could not fully enjoy the studying conditions agreed on in the pre-pandemic contract.

This research explored the psychological and academic effects of studying from the home and host country during the COVID-19 pandemic, using online survey data from international students in UW, Poland. By developing our understanding of international students' life and academic experience, we make several contributions to the psychological and international

higher education literature. First, results showed that the country-of-residence variable was not significantly correlated with psychological variables (Hypothesis 1a rejected) but only with two aspects of academic experience (Hypothesis 1b partly supported). Specifically, students in their home country found communication with peers more contributing to their online learning experience and showed higher adjustment. This result is in line with cultural adjustment frameworks (Black et al., 1991; Kim, 2001; Ward, 2004) that view communication competence (with an individual's affective, cognitive, and behavioral skills) and communication interactions as critical determinants of adjustment. Moreover, they link adjustment with (familial, peer) support structures, which is supported by academic adjustment research (e.g., Shu et al., 2020). The result implies that universities should pay careful attention to fostering peer communication in online learning (e.g., by promoting group work and collaborative learning) and developing social support structures (e.g., by fostering online discussion groups allowing students to share experiences with peers, or online social activities attenuating the sense of loneliness), as these enhance academic adjustment. Moreover, because students in the home country show higher levels of academic adjustment than students in the host country, universities should develop compensatory support services for the latter based on their unique nationalities and cultures (Chirikov and Soria, 2020), which could enhance their adjustment to online learning.

We found no support for the hypothesized country-specific differences in the experience of acculturative stress (Hypothesis 1c rejected). The lack of country-specific differences in the perceived discrimination and communication stress may result from the nature of the learning-from-home experience itself. This experience considerably limits social interactions with other students and locals, thereby limiting occasions for comparing international students' experience to other students' experience.

However, a difference in experiencing discrimination stress occurs for students in self-isolation in the host and home country; no such difference was found for communication stress, which may be explained by social distancing and limited opportunities for communication with locals in the host country (Hypothesis 2a partly supported). A higher level of perceived discrimination resonates with prior research on the negative effect of social distancing on students' mental health (Fu et al., 2020; Tang et al., 2020; Zhao et al., 2020). It may suggest that the disruptive experience of social isolation may arouse the feeling of receiving lower-quality service as compared to other students, which may be caused by the fundamental attribution error (Ross, 1977). Self-isolation is a stressor that causes boredom and increased emotional distress and dissatisfaction (Presti et al., 2020; Yan et al., 2021). Moreover, besides learning from home, self-isolation potentially exposes students to smartphone/Internet overuse that has been linked with depressiveness (Duan et al., 2020). Accordingly, self-isolating students may attribute their dissatisfaction with the disrupted experience to the university. Thus, to minimize the negative implications of self-isolation for international students, universities should pay careful attention to more effective and culture-sensitive communication of pandemic-related messages and support structures available at

the university. For example, email messages informing students on the organization of online learning, virtual events, and other services (e.g., extracurricular courses, psychological help) could be sent out to all students in both the host language and English, so that international students are aware of their fair treatment as compared to domestic students. Moreover, to enhance students' coping responses to the pandemic, students in quarantine or self-isolation should be provided with special psychological support and therapy through digital technology (Xiang et al., 2020), especially given the fact that international students highly appreciate psychological help received from the university and expect an increased number of therapeutic sessions (Wilczewski et al., 2020). Notably, training students on stress management could also contribute to their coping with emotional distress (Yan et al., 2021) and satisfaction with university services.

Finally, the expected increased levels of social and emotional loneliness among self-isolating students in both countries were essentially confirmed in this study, with the difference in experiencing social loneliness in the home country being close to reaching statistical significance (Hypothesis 2b partly supported). Our results resonate with the results of prior research on domestic students' mental health and loneliness (Elmer et al., 2020) and extend their validity to international students studying in the host and home country. However, no statistically significant relation of self-isolation with a student's life or academic satisfaction was found (Hypotheses 2c and 2d rejected, respectively), which may again be explained by the specific nature of the academic experience of both groups of students that participated in learning from home no matter if in self-isolation or not.

This study is not without limitations that, nevertheless, warrant avenues for future research. First, the cross-sectional nature of this study prevented us from determining how long the benefits/challenges related to participation in online learning from the home or host country would last. Although longitudinal research could resolve this important question, we are aware that researchers have limited opportunities to reach out to students with similar research instruments during the COVID-19 pandemic when students are systematically invited by the university to participate in online surveys to monitor how they perform in online learning. To overcome this limitation, universities could develop research policies promoting collaboration between researchers and the transfer of knowledge across research projects drawing on data collected from students. Second, due to the limited space in the questionnaire survey, this research did not measure other psychological factors that could explain country-specific differences in students' mental health. As the most recent research has found the critical role of coping styles and the dark triad in coping during the pandemic (e.g., Nowak et al., 2020; Zajenkowski et al., 2020; Triberti et al., 2021; Yan et al., 2021), those should be considered as control variables in future research on the international student experience in the host vs. home country. Third, although we captured student online learning experience, we did not measure students' support structures (e.g., perceptions of contacts with family,

peers, or social networking). Involving those variables could explain the observed differences in the perceived role of online communication and acculturative stress in a more comprehensive way. Finally, future qualitative studies could better contextualize research into students' learning experiences from the host and home country, thereby exposing country-specific factors (e.g., different social distancing patterns) determining students' life and academic experiences.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Rector's Committee for Ethics of Research with Human Participants at the University of Warsaw. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

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The Pandemic That Has Forced Teachers to Go Online. Zooming in on Tips for Online Teaching

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INTRODUCTION

The COVID-19 pandemic has forced an immediate worldwide transition from frontal teaching in classrooms and lecture theaters to online-teaching on various video conference platforms. Because of its suddenness, little framework or guidelines existed for online teaching. It is important to think about how to create the common ground of a classroom that enables open dialogue, that encourages students and that creates a safe learning environment. Here, I describe my own quest in online teaching in a course of Molecular Cell Biology for undergraduates. It has been a search on what works best, and how to adapt to the new style of teaching compared to in-class teaching. The new era requires lenience from teachers and an openness to learn from the younger generation. *They* may teach *us* on their experience with an online environment.

The COVID-19 pandemic has tremendously affected the way of teaching as it suddenly switched from an in-person to an online format. How immense and sudden this transition has been, is illustrated in a recent survey among 1,400 American colleges. The two colleges that reported to go fully online on the 6th of March 2020 were followed by all remaining colleges within the same month (Marsicano et al., 2020). Although online teaching has been among us since the start of internet during the early 1990's and its success has been reviewed (Martin et al., 2020), the above figures on the sudden implementation indicate that the world-wide teacher community had to implement online methods at short notice. Surveys on teacher preparedness confirm the low level of preparedness at the beginning of the pandemic (Scherer et al., 2021). In this paper, I will describe the choices I have made when it became apparent in August 2020 that all teaching had to go online for the entire first term, from September until December 2020. I have been teaching a theoretical course of Molecular Cell Biology to two groups of 25 students for the past 5 years at Amsterdam University College (AUC), 4 h a week per group. AUC is an international liberal arts and sciences college, all classes are English taught (De Vries et al., 2019). My classes regularly contain at least ten nationalities. AUC classes are more interactive than regular lectures and also focus on student engagement in the conversation. My course is aimed at second-year students and is part of the pre-medical track, using chapters from the broadly used Essential Cell Biology (Alberts et al., 2019). Below, I describe what it meant in terms of infrastructure of the course and how I tried to build a classroom environment. Next, I describe the essence of continuous evaluation by students and teachers when going online and finally I acknowledge the new possibilities of online teaching.

Confronted With Going Online

Though classes went straight online from early March 2020 onwards, quite a bit of uncertainty prevailed during summer 2020, when COVID-19 figures dropped severely in the Netherlands and across Europe. In August, it became apparent that three teaching variants would be installed at AUC: (1) in-class teaching to the whole group, allowing classes of ~12 students per classroom; (2) a mixed variant, or hybrid teaching, where

the teacher could choose to have 12 students in-class and the others online; and (3) a fully online course. On top of that, AUC had to comply with 20% of the maximal occupancy of the building, to allow for enough ventilation and enough space between those inside. First-year classes were prioritized to be in the building when possible, given the necessity of bonding between the newly arrived students. Given the fact that my class was for second year students, I decided from that point onwards to go 100% online.

The choice to go online and the enduring pandemic affected teaching in multiple ways, the first of which was my course program. For instance, I was not able to organize a lab excursion designated to learn some pipetting skills, since we had to obey the governmental restrictions at my lab. Instead, I planned five meet-the-teacher-sessions, which I was able to host during the largest part of the semester in small groups at a time with the 1.5 m distancing discipline. This was my only opportunity to physically see my students. In hindsight, this provided a necessary opportunity to escape the 2D-images I had from my students, making them more complete characters, with their individual peculiarities. I thoroughly enjoyed these sessions which were scheduled after the three exams and for essays as feedback opportunities.

Apart from these COVID-19 affected arrangements, I had set an important additional teaching goal for this season which I now had to implement online. I wanted to invest much more in familiarizing students with the laboratory techniques of Molecular Cell Biology. This is a sensible investment, since I discovered during previous years that this knowledge was a shortcoming of many students. It is important to know these techniques, because students have to read biomedical research articles in the late stages of the course but also in parallel courses in the Medical Track. For protein detection, I wanted students to be familiarized with immunohistochemistry, flow cytometry, Western blotting and enzyme linked immunosorbent assay (ELISA). I knew about Zoom, a popular video conference platform which has been used successfully for online teaching since March 2020. So, I designed "technique tool boxes" for each of the molecular cell biological techniques, and applied a mixture of flip the classroom (Styers et al., 2018) and jigsaw (Sanaie et al., 2019) as an educational design. Jigsaw is a teaching technique where the receiving side of teaching has to reproduce what was taught. A recent meta-analysis of flip the classroom showed that it has varied outcomes in terms of learning outcomes compared to a more frontal classroom approach, with the teacher in the lead. Success rate was higher when adding extra hours in class for it (Van Alten et al., 2019). Compared to the previous year, I allotted one extra class to achieve my learning goals on mastering the theoretical aspects of cell biological techniques. In essence, I split students into groups through breakoutrooms where together, each group had to finish an unfinished PowerPoint presentation, the toolbox, and present that next class to the whole class. I did this in the second week of the course, so that students could benefit from what was learned for their essay and presentation work, where they had to cover molecular cell biological research papers. The toolboxes were completed by the students and by putting it on the digital learning environment Canvas, students could further study it for the exam, where students had to answer

questions about their own techniques and about the ones that were presented by other groups (jigsaw). This way, students made their own learning material.

When the first lessons were approaching, I had to familiarize myself fully with the online platform of Zoom with the help of my daughters in higher education and friends with whom I could practice. Nevertheless, I experienced a lot of anxiety just before the first class. Will all students log in? Is my internet connection satisfactory? How is my audibility? Most disastrous was that construction workers started working just a few houses away, 15 min before my first class. Luckily, the drilling noise was not disturbing to my audience.

Mimic a Classroom Environment

One of my goals in this unfortunate era of scarce contact, was to invest in creating a classroom setting. I did this by opening Zoom 5 min before the start of class, switching my camera off, being muted. One by one, students entered, on mute and most of the time leaving their cameras off. I started class by unmuting and by switching on the camera. After doing this, I asked everybody to switch on the camera, so that we could see each other. The first class was used to introduce us to one another. I did this in my class by choosing a favorite organelle, or mini-part of a cell. At this stage, I usually show what a future career in molecular cell biology could hold, by showing a short video of a role model. This year, inspired by the black lives matter movement and how diversity is still lacking in the higher levels of university (Barber et al., 2020), I showed a wonderful little video on Tracy Johnson, a scientist-teacher at University of California at Los Angeles (UCLA) and a role model both for teachers and students, who had just been rewarded with a prize on undergraduate teaching https://www.youtube.com/watch?v=cNu7qSag9f8. The clip of 4 min contained many wonderful quotes that students could relate to. I asked the students to write down and share quotes from the clip that appealed to them.

When sharing a presentation, it is obviously not possible to have a classroom experience, but as soon as the "stop share" was activated, all of us came back in class with cameras on. Zoom, like other platforms that are suitable for online teaching, has the pleasant feature that names of students are visible in the individual's zoom screen. For me, this was a blessing in disguise: making it much easier to learn names this year. Another aspect of mimicking a classroom is that I encouraged students to interrupt me by unmuting. This enabled students to freely ask questions and opened dialogue amongst participants, as the regular practice of raising hands was not possible on Zoom. In a class with a maximum of 25 participants, this is absolutely doable and allows each student to participate to the extent that they are comfortable with. At the end of class, I made it possible for students to linger a while if they still wished to conversate on the topics discussed in class or otherwise. Thus, a very inviting and informal atmosphere was created, with some resemblance to a classroom.

Acknowledge and Verbalize the Achievements and Shortcomings of the Online Teaching

Online teaching was relatively new for all of us and it required experiencing what works best. Right from the start, I expressed

to the students that we are in it together, and that I am there to help students with any difficulties they might face. Feedback on how to improve was welcome at all stages of the course. This year I have developed an awareness for the students online coping ability. It is important to show compassion. One has to develop a new repertoire of what works best (Biggs and Tang, 2011; Schoenmaker et al., 2020). I very quickly abandoned the idea that I have to cover the prerequisite chapter of the book in two hours of teaching with some interactive moments. Instead, I summarized the chapter during the first hour – also providing a lot of opportunities to interact - and after a short break, I used the second hour to assign students to breakout rooms to make questions on that chapter. I then finished with a plenary session where students were in the lead, answering and debating the questions.

During a mid-term course evaluation, students further suggested to use the quiz function of Zoom as a starter of class, to engage and energize the possibly sleepy students and those students who are tired after a day of online activities. Although quizzes may not be the ideal extra preparation for exam results (Haberyan, 2003), the incorporation was functional, since it was also a way to reflect on weekly societal aspects of Molecular Cell Biology, for instance why the RNA vaccine from Moderna did not require low storage temperature, whereas the Pfizer/Biotech vaccine did.

It is also good to express what goes well in class, especially with online teaching. So, more than ever, I genuinely complimented the group when there was good group participation. It is important to acknowledge that these times with online teaching are extremely difficult. As a teacher, one should demonstrate curiosity about how the students experience online classes. Student presentations were all online as well, using shared screen, without frontal explanation in a classroom. I wanted to know whether it was more difficult or more relaxed when presenting from home, sitting in a chair. To my surprise, most students thought that this was way more relaxed.

One should foster awareness beforehand on what can go wrong during presentations. With an unreliable internet connection, students may become unnecessarily nervous and also may use more time than anticipated. As a teacher, one should be ahead of this and tell students in advance that when the internet connection does not work properly for whatever reason, it can never be held against the student and that the student has the right to re-do the presentation at a later time. I also realized that due to Covid-19, students could be sick for a while or in quarantine. So, it is also important to schedule extra time slots for presentations by students.

Find and Exploit the Benefits of Online Teaching

Not all aspects of online teaching are doom and gloom. For instance, in my course, I have always scheduled approximately four specialized guest speakers from the Amsterdam-based academic institutes. With the same effort, one can now invite specialists from all over the world! This year, I invited a friend from Brazil, who presented on his molecular cell biological work on infection models and bone degradation by osteoclasts (Souza and Lerner, 2019). For the internationally oriented students, this was not only a way to be introduced to cell biological research at work, but it also exposed them to the international opportunities and limitations of doing that in Brazil. In terms of time efficiency and planning, cost reduction and reduction in air pollution, nothing beats such a guest lecture! Less than a year ago, such an opportunity would never be even considered.

Another wonderful feature of online teaching is the possibility of using breakoutrooms. When used intelligently, one can create a relatively quiet learning environment in which the students can discuss tasks set for the specific class. This allowed for some focused work between students, and when finishing early, it also enabled informal exchange, very important in times of isolation such as during a pandemic. When compared to in-class splitting up of groups, the serenity of breakout rooms is wonderful. As teacher, one can "apparate" as J. K. Rowling's Harry Potter characters do, that is, to appear and disappear or "disapparate" in breakout rooms, just to monitor how the process is evolving. It still feels like magic. It is also fun to invent new jargon, not only with the Harry Potter analogy, but also that when I closed the breakoutrooms, I mentioned that we were back in the "general assembly."

Exams of my course were done in the old-fashioned way: open questions, written on paper with the occasional question that required drawing a schematic. In fact, the exams were a rare opportunity of seeing my students. Students sat 1.5 m apart, I supervised wearing a face mask. Due to COVID-19, some international students were confined to their home country due to travel restrictions. Other students were confined to their dorm rooms due to quarantine measures. I nevertheless insisted that those students would experience exactly the same exam. I used Zoom to simultaneously supervise exams all over the world. After finishing the physical exam-sit at AUC, I sent the exams 5 min before the exam, allowing a bit of time to print them. Through zoom, I was at one point able to simultaneously supervise exams in Canada, the United Kingdom, Latvia, France, Poland, Macedonia and Bulgaria. It gave a special sense of connectedness! After the exam, students could scan their written result as a PDF or alternatively take pictures of the exam and send them back by email.

DISCUSSION

Finally, this Opinion article on my own quest in online teaching puts the online teaching in broader perspectives. First of all: will online teaching be the future, and, specifically on courses like Molecular Cell Biology: what are the challenges when the labs remain closed?

Online Teaching: the Future?

Since the teaching community in higher education has had only one year of experience, online teaching has not been evaluated extensively. Possibly, an opinion gap exists between teachers and students whether online teaching should be continued. When Covid-19 restrictions were lifted in South Korea after a period of lockdown, allowing teaching in classrooms to resume, no

<84% of medical students preferred to continue class online, whereas only 14% of teachers wanted to continue this way (Kim et al., 2020). In a recent Indian survey among medical students and teachers, 54% of the students wanted online classrooms to be continued, whereas another considerable part (24%) wanted to return to in class teaching. Teachers foresaw a mix of both traditional and online teaching in the future, and that possibly a mix of 70:30 could be ideal (Gupta et al., 2021). Whether we will ultimately embrace online teaching, remains to be seen and is likely also dependent on whether audibility and strength of internet connections. A recent survey among students and teachers in Iraq, reported increased difficulties due to COVID-19 enforced online learning among 69% of students and 51% of teachers (Tuma et al., 2021). Also in the United States, a nation-wide survey among pharmacology students revealed that only 30% of the students preferred blended approaches, whereas 47% explicitly wants to return to normal classes (Hamilton et al., 2020). A survey from the United Kingdom reported much higher workload for teachers, <50% felt confident with online teaching, with the odd exception of teachers in Computer Sciences, where confidence reached 76% (Watermeyer et al., 2021).

Back to the Classroom, Back to the Laboratory

Specifically for Molecular Cell Biology, one should refrain from training only theoreticians. At the moment, due to the long lasting COVID-19 restrictions, there is a world-wide concern that a new generation of undergraduates will be delivered that will have no laboratory experience due to the restrictions that prevail. There are interesting initiatives to experience a virtual lab online, with movies showing how to pipet, with instructions on microscopy and on a lot of laboratory protocols (Delgado et al., 2020), but let us hope that this will be a temporary solution, since otherwise students will be alienated from the world of scientific discovery and innovation.

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Music Student's Approach to the Forced Use of Remote Performance Assessments

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Music students at the University of Chichester Conservatoire completed questionnaires about their experience of the forced use of remote teaching and learning due to Lockdown, as imposed in the United Kingdom from March to June 2020, and how this impacted their self-beliefs, decision making processes, and methods of preparation for their performance assessments. Students had the choice to either have musical performance assessed in line with originally published deadlines (still in Lockdown) via self-recorded video or defer the assessment until the following academic year. Student's choice to defer or submit the assessment during Lockdown was influenced by a range of forced factors, such as adaptions required by online teaching, limitations of rehearsal in their home environment, and the challenges in facilitating and recording their own assessments. Students completed online questionnaires about their self-efficacy, resilience, wellbeing, and provided free text responses explaining the reasoning for their decision to record their performance or to defer the assessment were coded to reveal patterns impacting their decision and preparation processes. Those choosing to submit their assessments demonstrated more strategies in their preparation and reported higher perceived self-efficacy scores. The specific conditions for this assessment, as a result of Lockdown, revealed correlations between resilience and both self-efficacy and wellbeing. The impact on teaching and the student experience is discussed and suggestions to support students in future settings of blended delivery are presented. Theoretical and practical implications are discussed.

Keywords: resilience, self-efficacy, higher education, assessment, COVID19, music

INTRODUCTION

Musicians transmit their art to listeners through performance. Within music education, students develop their skills in performance and are assessed as they develop and progress through their degree programs. These performance assessments are affected by a range of contextual and situational influences, such as the physical properties of the hall or space and interactions with others in the performance setting, even before the interpretative and evaluative judgments are considered (McPherson and Thompson, 1998). Beside the skill, expertise, and associated physical demands required to execute a successful performance, the process of preparing for a musical performance assessment involve various qualities related to a person's self,

such as resilience, self-efficacy, managing wellbeing, and the use of self-regulated learning strategies (Ericsson et al., 1993; Williamon, 2004; Miksza, 2012; Ritchie and Williamon, 2012; McPherson et al., 2019).

The novel coronavirus (SARS-CoV-2), and the forced quarantine of Lockdown has had a significant impact globally (Brooks et al., 2020; Jiang, 2020; Petzold et al., 2020; Qiu et al., 2020; Remuzzi and Remuzzi, 2020; Ritchie et al., 2020; Walsh, 2020; Yıldırım and Güler, 2020). The higher education sector has not been immune to the disruption and has met the situation by quickly and dramatically adjusting aspects of learning, teaching, and assessment. Music students in higher education have been impacted by the move to online education during this pandemic, specifically in terms of their interpersonal relationships with their teachers, and in general, by reporting more stress and fewer dedicated practice hours (Philippe et al., 2020; Rosset et al., 2021). Although in recent decades student learning processes have been more actively integrated into the assessment process, the range of assessment strategies within the higher education sector is not diverse (Boud and Falchikov, 2006; Craddock and Mathias, 2009). Change has been seen in higher education assessment practices, an example of which can be found in Florence, where alternate practices of peer and self-assessment were adopted to engage students as active agents in their learning (Di Stasio et al., 2019).

The UK Quality Assurance Agency (QAA, 2018) outlines guiding principles for assessment in higher education which include advice that assessment is "explicit and transparent" and "students are supported and prepared for assessment" (p. 5–6). In times of a pandemic, this is a challenge, especially when everything from the mode of delivery, to the location, to the timing, as well as aspects of the assessment itself changes in a matter of days.

The student experience is wider than the assessment context, and aspects of mental health and wellbeing have gained attention in education globally, with students showing increasing signs of stress (Russell and Topham, 2012; Macaskill, 2013; Hamdan-Mansour et al., 2014). Universities are becoming increasingly aware of the importance of understanding student mental health and wellbeing and employing preventative measures to alleviate this increasing problem (Dehaas, 2011). As places of learning, institutions continually work to improve students' experience in education, fostering resilience in learning, and preparing students for their professional lives after graduation (Spronken-Smith, 2013).

The understanding of resilience as a multidimensional mechanism combining several personal characteristics and skills, internal processes, and external outcomes (Leipold and Greve, 2009; Goodenough et al., 2020) has evolved. It has moved from focusing solely on having the psychological strength to maintain stability during times of stress and change (Flach, 1997; Combes-Malcome, 2007), to include a much broader definition including the importance of "accessing and maintaining wellbeing and wider interactions with family, community, and culture" as part of the response to an adverse situation (Ungar, 2008, p. 225). Pooley and Cohen (2010) went on to define resilience holistically as "the potential to exhibit resourcefulness by using available internal and external resources in response to different contextual and developmental challenges" (p. 30). Independent of the definition adopted, the adversity (change or risk) and successful navigation or adaption to a presenting challenge are fundamentally at the core of resilience in research settings (Schilling, 2008). In music, the relationship of resilience has received less attention, but is no less important. Kegelaers et al. (2020) found an inverse relationship between mental health and resilience and noted that music students were less resilient and more symptomatic than professionals. Osborne et al. (2014) suggest resilience training can enhance the wellbeing of music students in higher education.

Factors that relate positively to resilience are considered protective factors, and these come into play when dealing with the risk or adversity aspect involved in a conflict or challenging situation. For example, Lightsey (2006) theorized that a strong sense of self-efficacy was important for maintaining high levels of resilience. Self-efficacy beliefs are the self-beliefs people hold regarding their capabilities to carry out specific tasks and this criterial self-belief would then be a protective factor relating to resilience. Bandura (1977, 1993) first introduced and investigated self-efficacy beliefs and practically investigated the construct's strength by testing people's beliefs in their capabilities to carry out tasks relating to their phobias. This initial testing was in a psychotherapy setting, and these beliefs have since been found to be relevant to many areas of life within disciplines studied in higher education, from academic pursuits, to sport, to music (Pajares, 1996; Feltz et al., 2008; Ritchie and Williamon, 2011) and in wider areas of everyday functioning such as self-care (D'Souza et al., 2017). People's self-efficacy beliefs affect their choice of task, persistence, and perseverance, which all impact their achieved outcomes (Zimmerman et al., 1992; Greene and Miller, 1996; Muretta, 2005). Self-efficacy and its influences have been demonstrated to impact the musical performance and achievement of music students (Ritchie and Williamon, 2012; Zelenak, 2019).

The importance of self-efficacy and its relationship with resilience was supported by Nowicki (2008) where social support, a sense of belonging, and self-efficacy predicted 25% of adolescents' resilience. Sagone et al. (2020) found both that 11–19 years old became more competent as age increased and those with higher self-efficacy were more able to engage with unfamiliar situations and adapt their behavior to suit new circumstances.

In adult life, Djourova et al. (2020) explored the interrelationship of self-efficacy, resilience, and wellbeing in the professional workplace with social services workers, and found resilience mediated self-efficacy and wellbeing in relation to a person's leadership qualities. This cocktail of self-efficacy and resilience has also been highlighted as important for developing entrepreneurship within business and industries (Hallak et al., 2018). Within education, Hamill (2003) favored self-efficacy over other factors related to resilience and showed it to be an important factor in distinguishing resilience in 16–19-years-old high school students. Resilience is strengthened by enhancing and developing protective factors such as self-efficacy, emotional intelligence, and problem-solving skills when facing adverse situations (Reivich and Shatté, 2002; Pooley and Cohen, 2010).

Speight (2009) found empirical evidence of the relationship of academic self-efficacy to resilience, and Keye and Pidgeon (2013) also highlighted the importance of self-efficacy in relation to resilience with their investigation of 141 university students. McLafferty et al. (2012) reported that emotional intelligence related to resilience when studying students' ability to cope in higher education.

Aims

This study aims to investigate how university music student's preparation for assessment was impacted by the forced use of remote teaching and the sudden change in assessment, as required due to Lockdown in the spring of 2020, by considering their independent practice methods (self-regulated learning strategies) to prepare for assessments, self-efficacy beliefs, and questioning their decision-making processes. It was anticipated that those with lower self-efficacy would be less strategic and might attempt to avoid the assessment task by deferring to some point in the future.

MATERIALS AND METHODS

Context for This Research

Lectures, music lessons, and workshops all take place in dedicated spaces that are fit for purpose. Student music assessments are carried out in adequately equipped rooms, with appropriate instruments such as grand pianos or sound equipment as needed. Technicians are on hand to assist with both physical set-up and sound needs, if for example someone is using a microphone while performing a jazz song with a band. Due to the Lockdown, all teaching and assessment was moved online with a few days' notice.

This imposed situation was highly unusual at the university, as there are established quality assurance procedures for changing aspects of a published assessment descriptor (UOC, 2020a). The "Minor Change" process involves drafting documentation that is viewed and discussed by student representatives at a bi-annual subject board meeting, as well as being reviewed by the course's external examiner. It is then sent to the Academic Standards Committee for approval. All of this must be done in the previous academic year, so in essence, there are no surprises; changes are both planned and publicized well in advance. The only unforeseen changes that are allowed are Mitigating Circumstances which allow individuals with extraordinary and documented extenuating circumstances to have extra time or perhaps a modified assessment in order to accommodate their particular situation (UOC, 2020b).

Teachers moved their sessions online, although because of audio limitations, neither group or ensemble work nor accompanied musical performance, requiring multiple people to produce sound simultaneously, was possible to carry out in a simultaneous manner with video conferencing technology. Therefore, interactive musical work, especially in settings where a teacher might accompany their student, could not be practically achieved in the same way as a live situation. Adaptations from both the student and teacher were required to meet the demands

of the situation. With forced remote learning, students needed to adopt more self-regulated learning strategies, taking initiative and carrying out the required methods and behaviors to learn and complete tasks (a detailed explanation of musical self-regulated learning strategies and behaviors, see Miksza, 2012; McPherson et al., 2019). In order not to disadvantage students, they were all given the option of either adapting to submit their performance assessments via video recording, made by the students wherever they were (e.g., their home setting) or to defer the assessment until the following semester in the next academic year with the aim of performing under the original, live setting at the university.

Participants

Undergraduate students studying music volunteered to take part in the research. Of the 84 students, 68 identified as completely female on the 11-point gender scale (Cervone et al., 2020; Haupert, 2019), and 13 identified as completely male, two identified in the middle of the gender scale (choosing 5) and one person reported not identifying on the scale. Students represented a range of year groups, with 48 (57.1%) first year, 25 (29.8%) second year, 8 (9.5%) third year, and 3 (3.6%) fourth year students. All students were preparing for final assessments at the time the questionnaires were completed.

Materials

This study used a combination of established questionnaires to collect empirical data and free text responses to collect qualitative data relating to student's experiences and perspectives on their assessment during Lockdown. The questionnaire pack included the Self-efficacy for Performing scale (Ritchie and Williamon, 2011), Warwick-Edinburgh Mental Well Being short scale (WEMWBS; Stewart-Brown et al., 2009) and the Resilience scale (Cooper et al., 2013).

The self-efficacy questionnaire, originally validated by Ritchie and Williamon (2011) has been used to assess the construct widely with music students, with direct relation to performance, and more widely with regard to the wider lives of musicians (Ritchie and Williamon, 2012; González et al., 2018; Zarza-Alzugaray et al., 2020). The Self-efficacy for Performing questionnaire consists of 9 items, several of which are reverse coded. To minimize bias the self-efficacy scale were labeled with the non-specific title of "attitudes toward learning/performance activities," as opposed to identifying the scale as measuring "self-efficacy," as suggested by Bandura (2006).

The WEMWBS was validated by both Tennant et al. (2007) and Stewart-Brown et al. (2009), and was recently successfully used in 4 years longitudinal study of 483 musicians from 10 conservatoires in the United Kingdom (Araújo et al., 2017). The short WEMWBS wellbeing scale consists of 7 statements about feelings and mental state, each rated on a 5-point scale.

The Cooper et al. (2013) Resilience scale has been used in professional contexts, and Cooper has been consistently associated with the interaction of resilience and wellbeing (Cooper and Leiter, 2017). The scale contains 16 items that are rated on a 7-point Likert-type scale labeled strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree,

and addresses four components of resilience: confidence, social support, adaptability, purposefulness. These areas highlighted by these subscales have been shown to relate to aspects of resilience across people's lives (see Masten and Wright, 2010). The Cooper et al. (2013) Resilience questionnaire used in the current research study was designed for use with people in their workplace, and as a goal of higher education is to progressively prepare students to be professionals, this questionnaire was deemed suitable to show these particular aspects of resilience in our students.

Students were asked to predict their grade on the performance assessment in question.

A phenomenological approach was adopted to collect qualitative data, following Creswell et al. (2007) and Turner (2010), and students were asked to comment, providing reasons for their choice of either submitting their performance assessment on the published date (by video during Lockdown) or deferring their assessment until the following semester (after Lockdown) and they were asked to explain how they prepared for this assessment. The full questionnaire is available from the corresponding author.

Procedure

An email was sent to students in the department, during the Lockdown period in May 2020 (2–4 weeks before their original assessment deadlines), inviting them to complete the questionnaires for this study online.

Data Analysis

Statistical analysis was carried out with data collected from the questionnaires using jamovi, 2020 (version 1.2.16; 2020). Initially, data for each observed variable were screened for their appropriateness to undergo parametric testing. For this, tests of univariate normality were employed, testing for acceptable skewness values (<2) and kurtosis ratios (<4) (Kline, 1998; Fallowfield et al., 2005). Skewness and kurtosis for all quantitative measures met criteria for normality, and the normal distribution of the data was then verified through the Shapiro Wilk test (Shapiro and Wilk, 1965; Cohen, 1977). See **Table 1** for descriptive statistics of these normality tests. As a result of satisfying these criterion, parametric tests were employed for all subsequent analysis. Before carrying out any relational analysis, Cronbach (1951) alpha was used to assess the reliability of all measures to test their suitability for use with this sample. A p-value of less than 0.05, was considered statistically significant for all analysis (Field, 2013).

Reliability analyses using Cronbach (1951) alpha scores were carried out for all the measures to test their suitability for use with this sample. All three questionnaires used yielded robust Alphas: The Self-efficacy for Performing scale yielded α = 0.829; the Resilience scale, comprising 16 items, yielded α = 0.776; and the WEMWBS questionnaire was very reliable, α = 0.827, signifying these measures were suitable to use with this sample.

Free text responses provided by students about their decision making and preparation for assessment were separately coded by two researchers for descriptive purposes. A thematic approach, following Braun and Clarke (2006) was used to group the reasons for the choice to submit/defer, with each condition having its own categories as drawn from the word choices used in the free text responses.

RESULTS

Descriptive statistics for all participants are shown in **Table 1**, and **Table 2** presents these for groups, based on whether students chose to submit on time or to defer the assessment.

Quantitative Data

65 students (77.4%) reported they would embrace the alternative assessment method and submit their performance work on time as a video, filmed during Lockdown and 19 students (22.6%) chose to defer the assessment to the following academic year. An independent samples t-test revealed students choosing to submit instead of defer the assessment had higher self-efficacy, $t(82) = 2.758$, $p < 0.01$. There were no significant differences between resilience or wellbeing scores for the two groups of students.

In line with expectations, student self-efficacy scores positively correlated with wellbeing ($r = 0.324$, $p < 0.01$), resilience ($r = 0.467$, $p < 0.001$) and student's predicted marks ($r = 0.606$, $p < 0.001$). Further, resilience was also correlated with wellbeing ($r = 0.528$, $p < 0.001$) and predicted marks ($r = 0.313$, $p < 0.01$).

Qualitative Data
Students Choosing to Defer

Those who chose to defer clearly listed reasons having to do with the inability to successfully deliver their performances during Lockdown. **Table 3** presents the categories of "live," wanting to perform to a live audience; "resources," a lack of physical resources; "teaching," feeling there was an inadequate level of teaching support for musical performance with online

TABLE 1 | Descriptive statistics and normality tests.

	Mean (*SD, SE*)	Skewness (*SE*)	Kurtosis (*SE*)	Shapiro-Wilk (*p*)
Self-Efficacy	44.7 (8.58, 0.936)	−0.271 (0.263)	0.085 (0.520)	0.287
Wellbeing	23.1 (5.44, 0.593)	−0.242 (0.263)	0.220 (0.520)	0.623
Resilience	54.7 (7.96, 0.869)	−0.215 (0.263)	−0.232 (0.520)	0.211
Predicted mark	61.2 (11.4, 1.23)	−0.483 (0.261)	0.939 (0.517)	0.026

SD. Standard Deviation; SE, Standard Error.

TABLE 2 | Descriptive statistics by group: submitting now/deferring.

	Submit now: Mean (*SD, SE*)	Defer: Mean (*SD, SE*)
Self-Efficacy	46.0 (7.53, 0.934)	40.0 (10.4, 2.40)
Wellbeing	23.3 (5.40, 0.670)	22.5 (5.68, 1.30)
Resilience	55.4 (7.50, 0.930)	52.5 (9.27, 2.13)
Predicted mark	62.0 (10.1, 1.26)	57.2 (13.5, 3.10)

SD, Standard Deviation; SE, Standard Error.

delivery; and "COVID," stress resulting directly from the virus itself. Representative student responses are provided to illustrate each category.

One third of the students who chose to defer their assessment demonstrated a reduced engagement in preparing for the assessment. Those who did state they continued to practice named particular strategies, for example "self-recording," "repeating to learn," and "focusing on muscle memory." Interestingly, the sample response provided which demonstrates considerable strategic engagement and teacher support (see **Table 4**, Practice), was from the same student who chose to defer because they felt online teaching, although they engaged with it, did not adequately prepare them for the assessment (see sample response in **Table 3**, Teaching).

Students Choosing to Submit on the Published Deadline

Those who chose to submit in alignment with the originally published deadline provided a range of reasons that, again, clearly fell into natural grouping categories. Students wanted "to complete" saying they wanted to "get it done," with final year students citing their desire to graduate as a driving reason to complete the assessment by the originally published date in the current academic year (see **Table 5**). Continuing students wanted to "avoid stress" as they progressed onto the next year of their degree, demonstrating elements of thinking ahead. Some students stated that they were sufficiently "prepared" and thus opted to submit now. Interestingly, five students felt they had no choice to defer, and were "forced" to complete now. It is unclear why they were under that impression as all students at the university had the option to defer to another semester, whether in this department or studying another subject. Two students were either unsure or had reasons completely unrelated

to Lockdown for choosing to defer. Three people cited multiple reasons for their decision.

The engagement with strategies was far more diverse and richer with the students choosing to pursue the original date under Lockdown conditions. One third of the students did not comment on their performance work, but listed strategies for accompanying written work. Only three students cited limiting factors in relation to their performance preparation. Unlike those who chose to defer, many of these students included several different strategies within their responses (see **Table 6**).

DISCUSSION

This Lockdown period presented a unique, unprecedented situation for academia, with a sudden, dramatic shift in teaching, learning, and assessment that was outside the normal remit of expectations within the context of higher education. In this study we were able to capture both snapshots of empirical data to illustrate the relationships of student beliefs as they experienced this forced change, as well as gathering free text responses to explain their decision making and approach to their chosen timing of the assessment.

The results demonstrated correlations between self-efficacy and wellbeing, resilience, and wellbeing. Typically, one would expect someone with high self-efficacy to also demonstrate qualities of resilience. In order to have self-efficacy beliefs, one must understand the criteria for the task and have an awareness of the processes involved in achieving it. Having strong self-efficacy beliefs reflects aspects of strength, adaptability, and the capability to navigate unknowns, which directly relate to resilience and existing self-efficacy literature has repeatedly shown that self-efficacious people engage in more cognitive strategies, persist longer, and are less likely to quit in the face of adversity (Zimmerman, 2000; Urdan and Pajares, 2006). These all align

TABLE 3 | Reasons provided for students choosing to defer their assessment*.

Category	Number	Sample response
Live	8	I am deferring my dissertation recital as I have spent months preparing it and would like an audience to share in it
Resources	7	I did not have a backing track available to me when making the decision...
Teaching	2	... and I do not feel that working on my pieces over zoom has given me enough confidence to submit them now
COVID	3	Due to anxiety surrounding the epidemic I'm finding it really hard to practice my flute (as well as complete assignments). Especially with a lack of accompaniment and teacher for support

Two people specifically cited two categories, an example is presented in the quotation for resources and teaching; this is the response of one person.

TABLE 4 | Assessment preparation strategies for students choosing to defer.

Category	number	Sample response
Practice	12	I have had 5 zoom singing lessons and have been doing the exercises I have been set as well as sending my teacher videos of my songs for feedback
Practice less	3	I am practicing the material less frequently as I have a lot longer to wait. I also do not have access to an acoustic piano and practice on a keyboard, I'm told, is pretty ineffective for classical repertoire and may lead to bad habits that are not possible to replicate on a Steinway
Not practicing	1	I've deferred so I'm not currently preparing for it
Non-musical methods	3	I am now just looking over the scores/arrangements until a new date is set, at which point I'll begin my 1-1 lessons again. I am working nights so am unable to sing during the day at home

TABLE 5 | Reasons provided for students choosing to submit their assessment by the originally published deadline*.

Category	Number	Sample response
Complete	37	Easier to get it done and out of the way, deferring it will delay it and won't leave my mind causing later stres.
Avoid stress	13	. . . and worry and the uncertainty of the times at the moment could mean it may be delayed even further
Prepared	9	Preferred to complete my assessment having worked on it for the year, as I felt well-prepared
Forced	5	We don't have a choice
Other/Unsure	2	Upcoming surgery

Three people cited two categories. The response in Complete and Avoid stress is a quotation from one person.

TABLE 6 | Assessment preparation strategies for students choosing to submit by the originally published deadline.

Strategies	Number	Example responses
No comment provided about performance	14*	By researching and thinking about myself
Limitations	3	I am preparing by practicing in my bedroom but not as much as I live in terrace housing and my neighbors have been complaining
Proactive strategies:	47	Planning ahead and doing it 2 weeks before I sent mock recordings to my various tutors, and used facetime and skype to discuss areas of improvement
Planning, self-recording, seeking feedback from teachers and peers, using family to assist, engaging with new technology/methods (online lessons/self-editing), engaging with online resources (teacher videos)		Recording in advance so that I don't have the worry of uploading. Also practicing when I can, wherever I can alongside getting my family to help me record

12 students commented on preparation not for performance, but for accompanying written work, 1 student reported already having submitted the work at the time of completing the questionnaire, and 1 person changed their mode of assessment to no longer include performance.

with the concept of resilience (Keye and Pidgeon, 2013). It makes logical sense, therefore, that those with higher self-efficacy for performing, would also demonstrate more strategies as they worked toward that achievement.

Students who adhered to the published dates for assessment despite the Lockdown conditions responded with a sense of "must." Although these students choose to submit on time, the task was still significantly different, as they had to perform wherever they were, organize and achieve an appropriate recording, and deliver this to the teacher in the required manner. These students had higher self-efficacy for the task in question than those who chose to defer, but their reported need to "get it done" to either allow for graduation or to avoid further stress demonstrates the impact of this unique Lockdown situation.

Although those who chose to defer cited reasons why they could not complete their assessments on time, this was not a considered decision resulting from simply embracing a few extra months to learn, but instead was a statement of "can't," expressing unsurpassable constraints. When "can't" becomes a mindset, the possibility of achievement is removed. This perspective of having an unsurmountable challenge in progress or achievement also aligns with someone who has lower self-efficacy beliefs (Muretta, 2004; Speight, 2009). These students were more articulate with their reasons why *not*. There were a very few in this group who stated strategic engagement beyond continuing to "practice." The time delay and uncertainty of a future assessment that would take place in the next academic year meant that students did not necessarily perceive a hierarchical path to the goal. The clarity of the proximal goal they had been approaching was taken from them, along with the accompanying equipment and support. This has implications for educators when considering how to provision appropriate student support for the task. The goal posts have moved in a way that is new for everyone.

Despite the dramatically altered conditions where teaching was forced online, and where students were without the physical rehearsal space or support and had to learn the technological skills of recording themselves, students did demonstrate a variety of strategic approaches, which are qualities associated with self-efficacy, as they pursued submitting their recorded assessments on time (Cervone et al., 2004). The multiplicity of strategies and the use of self-directed learning to engage with resources, people, and to develop new skills aligns with expected behavior of people with higher self-efficacy beliefs.

Strategic use, and in this case self-regulation involves actively initiating learning and negotiating challenges through choice and strategy use as opposed to following set, external instruction (Ritchie and Williamon, 2013). The strategies students adopt depend on their resourcefulness and capability for engaging with cognitive processes; if students either do not understand or are not proficient with a method, they are unlikely to use it. Although self-regulation implies the student undertake these processes independently, within higher education students are not always aware of being independent agents (Scott et al., 2015; Henri et al., 2018).

Any assessment task will be benchmarked and should be aligned with the taught skill set (Biggs and Tang, 2015). This unforeseen shift in the student experience has highlighted an opportunity to indeed support students in areas of skill development, awareness, and indeed resilience. Many of these students did demonstrate strategic thinking and independent learning strategies, but it was clear that there were also negative motivators, and it should not be out of avoidance of adverse consequences that students are motivated to complete their assessments. As blended forms of learning become the "new normal" in the future, and include alternate forms of engagement

and assessment, educators should take a broader view of the way they prepare and expect students to engage with their curricula.

LIMITATIONS AND FUTURE DIRECTIONS

Previous music research has not been undertaken with a similar situation, and to recreate these Lockdown conditions in future studies to replicate the inverse relationship of resilience to self-efficacy and wellbeing would require imposing significant restrictions on student learning and might be difficult to ethically rationalize recreating.

Our findings provide further insight into the influence of COVID-19 on student experience. However, given the scarcity of research including musicians during this period (Philippe et al., 2020; Spiro et al., 2020; Tymoszuk et al., 2021), the sample size being determined by accessibility and time constraints (as is common in psychology research; Lakens, 2021) and the influence posed by this pandemic, we encourage caution when interpreting the study's p-values in a generalizable way. As such, future researchers must extend the current findings (e.g., comparing the impact of teaching and student experience before, during and after COVID-19).

There is a need for self-efficacy, wellbeing, and resilience in our changing world, and specifically for music students as they prepare to enter professional careers. The present research demonstrates the interrelatedness of these constructs and the importance of a wider awareness of the student, beyond providing material and access options, to include understanding aspects of the student's experience of learning and their self-beliefs. As music educators we can equip students with both

strategic methods for self-regulation and develop resilience through dedicated training programs to enable them to better cope, not only in their educational environment and after graduation in their future workplace, and facilitate adaptability when unforeseen circumstances force change.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://osf.io/n2up6/.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the University of Chichester Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

LR contributes to the concept, design, definition of intellectual content, data analysis, manuscript preparation, and the manuscript editing. BS contributes to the design, data analysis, manuscript preparation, and the manuscript editing. Both authors contributed to the article and approved the submitted version.

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How Do University Students' Perceptions of the Instructor's Role Influence Their Learning Outcomes and Satisfaction in Cloud-Based Virtual Classrooms During the COVID-19 Pandemic?

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This study examined the relationships between the role of the instructor and university students' learning outcomes in cloud-based classrooms during the COVID-19 (coronavirus disease 2019) pandemic. The results of an online survey of 7,210 university students in mainland China revealed that the students' perceived learning outcomes and learning satisfaction were positively related to instructor innovation and negatively related to instructor performance. Instructional support was positively related to the students' perceived learning outcomes but not directly related to their learning satisfaction. The students' academic self-efficacy mediated the influence of instructional support and instructor innovation on their perceived learning outcomes and learning satisfaction. The results contribute to knowledge of the role instructors play in facilitating students' learning outcomes in higher education and suggest ways to improve the learning environment and learning outcomes, especially in cloud-based virtual classrooms.

Keywords: instructors' role, learning outcomes, learning satisfaction, academic self-efficacy, cloud-based virtual classrooms

INTRODUCTION

The learning environment, whether traditional or cloud-based, is a significant determinant of students' learning process and outcomes (Eom et al., 2016; Al-Samarraie and Saeed, 2018). In the last few decades, the role of instructors in shaping students' learning experience and learning outcomes has been widely acknowledged (Martin et al., 2019). With increasing attention being paid to online learning environments, instructors are now regarded as "facilitators" (Martin et al., 2018) of student learning. However, most studies on online learning have been conducted in either asynchronous online settings or blended environments (Shea et al., 2006; Hew, 2015). Very little is known about the role instructors play in synchronous learning environments (Kuo et al., 2014a;

Martin et al., 2018), wherein the availability of cloud services has greatly improved the efficiency of communication between students and instructors (Baanqud et al., 2020).

The sudden outbreak of COVID-19 (coronavirus disease 2019) in mainland China and the subsequent pandemic resulted in the cancelation of all face-to-face teaching activity at all levels of education throughout the country. In higher education, under the guidance of China's Ministry of Education, cloud-based e-learning has served as a substitute for the traditional classroom or the blended learning environment since late February 2020. This reflects a change from forced online learning to the "new normal" e-learning environment (Parmigiani et al., 2019; Pham and Ho, 2020). Within this changed learning environment, how do university students perceive their learning outcomes and their instructors' performance? How do instructors influence their students' learning? This study aimed to address these questions by exploring the influence of instructors on undergraduate students' learning in the cloud-based virtual classroom in mainland China.

LITERATURE REVIEW

The Role of Instructors in the Online Learning Environment

Research on learning environments has been expanding for about five decades. According to an extensive literature review, research in this field has generated considerable insights into the relationships between aspects of the learning environment and earning outcomes (Allen and Fraser, 2007). For example, research has shown that, in the online learning environment, instructors' use of cloud-supported collaborative tools is positively related to the development of learners' knowledge construction skills (Baanqud et al., 2020). The relationships between the learning environment and students' cognitive and affective outcomes, such as motivation, efficacy, and engagement (Allen and Fraser, 2007; Alqurashi, 2016; Xu et al., 2020), have become one of the most important lines of inquiry in studies of the learning environment. The results of these studies have provided convincing evidence that the role of instructors is a significant determinant or predictor of student learning outcomes in both traditional and online learning settings (Eom et al., 2016; Martin et al., 2018; Yunusa and Umar, 2021).

A favorable learning environment improves students' learning outcomes (Kember et al., 2010). In the online learning environment, the instructor's role is one of the most important factors contributing to effective online teaching (Eom et al., 2016; Martin et al., 2019), in addition to commonly identified environmental factors such as the teaching technology, the course content, student–teacher interaction, and the learning model (Piccoli et al., 2001). Studies have indicated that in online learning environments, instructors can enhance students' understanding of the course content, acknowledge student engagement, and motivate students to explore new knowledge through various facilitation strategies and cloud computing tools (Martin et al., 2018, 2019; Xu et al., 2020). Instructors can also improve students' learning outcomes and learning satisfaction by using multiple

scaffolding strategies in online environments (Eom et al., 2016; Mamun et al., 2020).

Our review of studies exploring the role instructors play in student learning revealed that this topic has mainly been assessed in relation to instructional support (Kuo et al., 2014b), instructor performance (Ali and Ahmad, 2011), and instructor innovation (Lee, 2011). Students' perceptions of the quality of differentiated support for learning are one of the most important components influencing their independent learning and motivation (Lee et al., 2011; Mamun et al., 2020). In online learning environments, perceived instructional support includes timely and constructive feedback, clear instructions and explanations, and various scaffolding strategies from instructors (Lee et al., 2011; Martin et al., 2018; Mamun et al., 2020). Instructional support is a critical predictor of students' satisfaction and perceived learning outcomes in asynchronous online learning settings (Mullen and Tallent-Runnels, 2006; Yunusa and Umar, 2021).

Instructor innovation is the extent to which an instructor plans new and unusual class activities, teaching techniques, and assignments to establish a flexible learning environment that nevertheless maintains orderly and clear expectations (Fraser and Treagust, 1986). As a solution to challenges faced in contemporary education and as a mediator for change and adaption, instructor innovation improves students' learning outcomes and satisfaction (Walder, 2017). Current knowledge of the influence of instructor innovation on university student learning outcomes remains very limited in reference to online learning environments, although a preliminary study conducted in an asynchronous online environment suggested that instructor innovation is positively related to student learning satisfaction (Lee, 2011). The literature has also indicated that the application of appropriate e-learning strategies and skills to online teaching helps to improve teaching effectiveness and students' engagement and motivation (Xu et al., 2020).

Instructors play a vital role in creating successful online learning environments (Ali and Ahmad, 2011). They need to continuously acquire new skills and expertise to facilitate students' learning process and improve their learning outcomes (Martin et al., 2018). A good instructor must be able to ensure the expected interactions at the instructor–learner, learner–learner, and learner–content/technology levels (Beaudoin, 2009). They must also be able to determine appropriate learning tasks and tests based on the differences between individual students (Banerjee and Brinckerhoff, 2002). Similarly, the instructor's attitude toward and control of technology are a critical determinant of the success of e-learning and the effectiveness of students' perceived e-learning environments (Selim, 2007).

Students' Perceived Learning Outcomes and Learning Satisfaction

Across various learning settings, the literature has widely acknowledged that a proper learning environment can improve learning outcomes either directly or indirectly (Chang and Fisher, 2001; Allen and Fraser, 2007). To date, a number of variables have been used as indicators of students' multiple learning outcomes in educational research, such as examination scores (Hamer, 2000),

task performance and goal achievement (Deeter-Schmelz et al., 2002), and students' perceived learning outcomes and satisfaction (Eom et al., 2016). Students' perceived learning outcomes and learning satisfaction have been widely used as indicators of the quality of online learning (Eom et al., 2016). Students' perceptions of learning outcomes, which are based on how well students believe they have done in a course, provide important insights to inform course development (Rundle-Thiele, 2005; Kuhn and Rundle-Thiele, 2009). Students' learning satisfaction, defined as a short-term attitude resulting from students' evaluation of their educational experience, services, and facilities (Mukhtar et al., 2015), has been measured in terms of students' perceptions of the quality of learning in an online course, their enjoyment of the online course, and whether they would recommend the course to other students (Lee et al., 2011).

Many studies exploring the relationship between the learning environment and learning outcomes have indicated that instructors, a key predictor of satisfaction and perceived learning, help to improve student learning outcomes or satisfaction in online learning settings (Martin et al., 2018; Yunusa and Umar, 2021). Instructors have been found to be capable of motivating students to learn through instructional support (Mullen and Tallent-Runnels, 2006) and instructor innovation (Lee, 2011). However, as these studies have been conducted mainly in asynchronous online settings, very little is known about the influence of instructors, especially in terms of instructional support, instructor innovation, and instructor performance, on students' perceived learning outcomes and satisfaction in cloud-based virtual classrooms, a purely synchronous online learning setting.

Students' Academic Self-Efficacy as a Mediator

Self-efficacy in the traditional learning environment, also known as academic self-efficacy (ASE), has been widely defined as one's belief in one's confidence and ability to successfully accomplish a specific learning task in an educational setting (Bandura, 1986). This measure reflects students' expectations of how successful they will be in the classroom (Bandura, 1997). In addition to research examining the four sources of self-efficacy, i.e., enactive mastery experience, vicarious experience, verbal persuasion, and physiological and affective states (Bandura, 1997), several studies have investigated the influence of situational and instructional factors on students' self-efficacy in online learning environments, especially in higher education (Fryer and Bovee, 2016). Other studies have demonstrated that instructors help to foster students' self-efficacy through support connected to the above four sources of self-efficacy (Abbitt and Klett, 2004). In addition, research has consistently demonstrated that self-efficacy, a key element of social cognitive theory, is a significant contributor to students' learning outcomes (e.g., Schunk and Pajares, 2009).

Regarding the online learning environment, researchers have identified computer self-efficacy (CSE) and Internet self-efficacy (ISE) as significant variables in addition to ASE. "CSE" refers to an individual's perceived confidence regarding their ability to use a computer and has been found to be related to students'

learning outcomes in the computer-based learning environment (Moos and Azevedo, 2009). "ISE" refers to the self-assessment of one's ability to perform Internet technology-related activities to produce desirable results. With a prevailing interest in ISE rather than ASE in online learning environments, studies have demonstrated that students' ISE is positively related to their learning satisfaction and learning outcomes (Kuo et al., 2014b). However, most relevant studies have been conducted in asynchronous or blended online learning environments. A recent study conducted in a synchronous online learning environment revealed that students' ISE did not significantly contribute to their learning satisfaction, as the synchronous learning system may not require significant skills to perform Internet-related tasks (Kuo et al., 2014a). The positive influence of ASE on students' learning outcomes and learning satisfaction has been extensively researched, and the results have indicated that ASE may be a causal, mediating, or moderating factor explaining the relationship between ASE and the academic performance of university students (Honicke and Broadbent, 2016). However, Yukselturk and Bulut (2007) found that ASE did not predict students' Internet-based learning success. Thus, the relationship between ASE and students' success in online learning environments remains debatable (Tsai et al., 2011).

Based on the aforementioned literature, this study aimed to investigate the relationships between undergraduate students' perceptions of the role of their instructors and their own ASE and learning outcomes, focusing on cloud-based virtual classrooms in universities in mainland China. Specifically, the study was designed to address the following questions: (1) What are the relationships between students' perceptions of the instructor's role and students' perceived ASE, learning outcomes, and learning satisfaction? (2) Does ASE mediate the relationships between students' perceptions of the instructor's role and their own learning outcomes and learning satisfaction?

METHODOLOGY

Participants

In April 2020, an online questionnaire was administered to university students in a province in eastern China. The sample comprised 7,210 undergraduate students (62.2% female, 37.8% male) from two universities: a national research-oriented university ($n = 5,405$, 70.0%) and a provincial teaching-oriented university ($n = 2,165$, 30.0%). In terms of their year of study, 53.2% of the participants were freshmen, 24.7% were sophomores, 17.6% were juniors, and 4.5% were seniors. In terms of academic discipline, the sample comprised students majoring in the social sciences and humanities (55.8%), science and technology (41.2%), and medicine (3.0%).

Instruments

The online questionnaire had two parts and comprised 32 items. The first part collected demographic information such as gender, grade, major, and type of university. The second part consisted of four measures assessing the students' perceptions of the role of online instructors and their own online ASE, learning outcomes,

and learning satisfaction. The items were slightly modified to indicate the online learning environment. All were scored on a 5-point Likert-type scale ranging from 1, "strongly disagree," to 5, "strongly agree" (**Table 1**).

The Role of Instructors

Students' perceptions of the instructor's role were assessed in three dimensions: instructional support, instructor innovation, and instructor performance. Students' perceptions of instructional support were assessed using six items proposed by Lee et al. (2011), with slight adaptations to indicate the online learning environment. Instructor innovation was measured using four items adapted from the College and University Classroom Environment Inventory (Fraser et al., 1986; Johnson et al., 2000). Seven additional items were selected from Tallent-Runnels et al. (2005) to assess instructor performance.

Academic Self-Efficacy

To assess students' ASE in online learning, four items representing general ASE were adapted from the Learning Motivation Questionnaire (Lim and Kim, 2003). The adapted translation of these items was based on Bandura's (2006) suggestion that items measuring self-efficacy should be phrased in terms of "can do" rather than "will do."

Students' Perceived Learning Outcomes

Students' perceptions of the outcomes of online learning were assessed using three items adapted from the study of Eom et al. (2016).

Learning Satisfaction

Students' learning satisfaction was assessed by five items adapted from Lee et al. (2011).

Data Analysis

To determine whether the measures had satisfactory psychometric properties, exploratory factor analysis (EFA) using SPSS 22.0 software was first conducted to determine the factor structure. Next, confirmatory factor analysis (CFA) was conducted using AMOS 22.0 software to evaluate the item reliability, convergent validity, and discriminant validity. The reliability of the subscales was assessed by Cronbach α coefficients using SPSS 22.0. Repeated-measures one-way analysis of variance was conducted to evaluate whether there was a significant difference between the mean scores for the students' perceptions of the instructor's role, ASE, learning outcomes, and learning satisfaction. Structural equation modeling (SEM) via AMOS was used to construct a full model to explore the relationships between students' perceptions of the instructor's role, learning outcomes, and learning satisfaction, as mediated by ASE. As suggested by Schreiber et al. (2006), model fit is acceptable if the values of the comparative fit index (CFI) and the Tucker–Lewis index (TLI) exceed 0.90 and the value of the root mean square error of approximation (RMSEA) is smaller than 0.08. All of the results are explained in the context of the effect size according to Gignac and Szodorai's (2016) suggested guidelines (small = 0.10 to <0.20, medium = 0.20 to <0.30, large = ≥ 0.30).

RESULTS

Validity and Reliability

The 17 items were subjected to EFA with oblimin rotation using the maximum likelihood method. The Kaiser–Meyer–Olkin (KMO) measure verified the sampling adequacy for the analysis: KMO = 0.96, and all KMO values for individual items were higher than.79. Bartlett test of sphericity [$\chi^2(136) = 99,473.16$, $p < 0.001$] indicated that the factor analysis was appropriate. An initial analysis was run to obtain eigenvalues for each component of the data. Three components had eigenvalues over Kaiser's criterion of 1, and together they explained 72.73% of the variance.

Based on the factor structure determined by EFA, AMOS 22.0 was used to carry out CFA of the latent variables. A series of CFAs were conducted to test the factor structure of each standardized measure and determine the distinctiveness of the variables in this study. **Table 1** presents the results of the reliability and validity tests. All of the measures showed a good fit to the data and had acceptable levels of internal consistency and overall validity.

In terms of reliability, the Cronbach α coefficients of all of the factors ranged from 0.88 to 0.95, and the composite reliability coefficients ranged from 0.91 to 0.93, indicating that all of the constructs exhibited a relatively high level of internal consistency (Fornell and Larcker, 1981).

In terms of validity, the estimates of the square multiple correlation were over the required threshold level of 0.05, indicating that the constructs had acceptable item reliability. The standardized factor loadings of all of the items on their specific constructs, ranging from 0.69 to 0.95, were found to be statistically significant ($p < 0.001$), and all estimates of average variance extracted (AVE), which ranged from 0.62 to 0.87, were higher than the threshold level of 0.50. Therefore, the amount of variance explained by the items of measurement of the variables was greater than the amount of variance produced by measurement error (Fornell and Larcker, 1981), indicating that the constructs had high convergent validity. Discriminant validity was determined by examining whether the square root of the AVE was greater than the intercorrelations of the constructs. As **Table 2** demonstrates, the estimates for the square root of the AVE exceeded the correlation coefficients of each pair of constructs in all cases, offering supportive evidence of discriminant validity among the variables.

Descriptive Statistics and Correlations

Table 2 presents descriptive statistics for and correlations between the variables in this study. Overall, the mean scores for all of the subscales were above the midpoint (3) of a 5-point scale, which indicated that the students gave high scores for their perceptions of all of the factors. Of the three subscale measures of the instructor's role, instructor performance (mean = 4.13, SD = 1.04) had the highest mean score, followed by instructional support (mean = 3.88, SD = 1.13) and instructor innovation (mean = 3.80, SD = 1.03). Of the students' perceived learning outcomes, ASE scored the highest (mean = 3.45, SD = 1.11), followed by student perceived learning outcomes (mean = 3.40, SD = 1.03) and learning satisfaction (mean = 3.34, SD = 1.16).

TABLE 1 | Structural equation modeling testing the factor loading, reliability, measurement error, composite reliability, and AVE (n = 7,210).

Construct, CFA fit	Factor (no. of items)	Item	Factor loading	Square multiple correlation (SMC)	Measurement error	Cronbach α	Composite reliability (CR)	Average variance extracted (AVE)
The role of instructors (χ² = 7761.83, df = 116, p < 0.001, CFI = 0.92, TLI = 0.91, RMSEA = 0.069)	Instructor performance (7)	The instructors were available for online consultation during office hours	0.74	0.55	0.34	0.93	0.93	0.67
		The instructors stimulated student learning	0.79	0.62	0.23			
		The instructors treated all students fairly	0.80	0.64	0.21			
		The instructor treated all students with respect	0.87	0.75	0.14			
		The instructor welcomed and encouraged questions and comments	0.86	0.74	0.14			
		The instructor presented the information clearly	0.85	0.72	0.15			
		The instructor emphasized the major points and concepts	0.82	0.67	0.19			
	Instructional support (6)	The course goals/objectives were clearly outlined	0.77	0.59	0.31	0.90	0.91	0.62
		I knew what I was expected to accomplish each week	0.75	0.57	0.21			
		The instructors provided clear instructions for assignments and quizzes	0.69	0.51	0.47			
		The courses provided relevant resources	0.83	0.69	0.20			
		The feedback on the assignments was helpful	0.81	0.66	0.21			
		I felt that I could ask any questions regarding the course materials to the instructors	0.77	0.59	0.24			
	Instructor innovation (4)	The instructors adopted different teaching methods from those in face-to-face courses	0.78	0.61	0.26	0.91	0.93	0.76
		The instructors designed new online learning activities to get us involved	0.87	0.76	0.28			
		The instructors used various and innovative teaching methods in the online courses	0.90	0.81	0.18			

(Continued)

TABLE 1 | Continued

Construct, CFA fit	Factor (no. of items)	Item	Factor loading	Square multiple correlation (SMC)	Measurement error	Cronbach α	Composite reliability (CR)	Average variance extracted (AVE)
		The instructors assigned different learning tasks in online courses	0.93	0.68	0.15			
Academic self-efficacy (4) (χ^2 = 39.66, df = 2, p < 0.001, CFI = 0.99, TLI = 0.99, RMSEA = 0.073)		When compared to other students, I am certain that I can do well on the lesson assignments	0.83	0.69	0.28	0.88	0.90	0.76
		I believe that I can understand the concepts taught in online courses	0.88	0.78	0.18			
		I can utilize effective study skills in learning new concepts in online courses	0.90	0.81	0.15			
Students' perceived outcomes (3) (χ^2 = 141.44, df = 2, p < 0.001, CFI = 0.99, TLI = 0.99, RMSEA = 0.073)		I feel that online learning improved my learning performance	0.92	0.85	0.16	0.95	0.95	0.87
		I feel that online learning enhanced my effectiveness for learning	0.95	0.89	0.12			
		I found online learning useful		0.93	0.86	0.15		
Students' learning satisfaction (5) (χ^2 = 115.74, df = 5, p < 0.001, CFI = 0.97, TLI = 0.98, RMSEA = 0.069)		The courses increased my interests in the subject	0.86	0.75	0.29	0.93	0.94	0.74
		I felt I achieved the objectives in online courses	0.75	0.56	0.38			
		I liked the online course format	0.87	0.76	0.32			
		I felt comfortable in online courses	0.89	0.79	0.23			
		I would recommend the courses to others	0.93	0.86	0.17			

The correlations of the variables, as outlined in **Table 2**, were below the threshold value of 0.08. The results showed that instructor performance, instructional support, and instructor innovation were positively related to students' learning outcomes, all with large effect sizes.

SEM Analysis

Structural equation modeling analysis was performed using AMOS 22.0 to examine the relationships between the variables. The model was based on the assumption that correlations were allowed between the independent variables (instructor performance, instructional support, and instructor innovation), the dependent variables (student perceived learning outcomes and learning satisfaction), and the mediator (ASE). The model

(**Figure 1**) provided an acceptable fit to the data (χ^2 = 17189.93, df = 363, p < 0.001, CFI = 0.92, TLI = 0.91, RMSEA = 0.080), with the explained variance of 0.77 (students' perceived learning outcomes), 0.77 (learning satisfaction), and 0.58 (ASE). **Figure 1** presents a path diagram showing the relationships between the variables. The SEM results showed that instructor performance was negatively associated with student perceived learning outcomes (β = −0.39, p < 0.001) and learning satisfaction (β = −0.36, p < 0.001). Instructional support was positively related to self-efficacy (β = 0.41, p < 0.001) and students' perceived learning outcomes (β = 0.26, p < 0.001). Instructor innovation was also positively related to ASE (β = 0.39, p < 0.001), students' perceived learning outcomes (β = 0.43, p < 0.001), and learning satisfaction (β = 0.22, p < 0.001).

TABLE 2 | Descriptive statistics, correlations, and square roots of AVEs of the factors.

	Instructor performance	Instructional support	Instructor innovation	Academic self-efficacy	Perceived learning outcomes	Learning satisfaction
Instructor performance	(0.82)					
Instructional support	0.80**	(0.79)				
Instructor innovation	0.78**	0.73**	(0.87)			
Academic self-efficacy	0.66**	0.71**	0.70**	(0.85)		
Perceived learning outcomes	0.56**	0.68**	0.74**	0.73**	(0.93)	
Learning satisfaction	0.58**	0.73**	0.69**	0.73**	0.76**	(0.86)
Mean	4.13	3.88	3.80	3.45	3.40	3.34
Standard deviation	1.04	1.13	1.03	1.11	1.03	1.16

$**p < 0.01$.
The square roots of AVEs in parentheses along the diagonal.

TABLE 3 | The estimates of direct effects and indirect effects of the 95% confidence intervals.

Dependent variable	Independent variable	Direct effect	Indirect effect	95% CIs		R^2
				Lower 2.5%	Upper 2.5%	
Perceived learning outcomes	Instructor performance	− 0.39	0.01	− 0.02	0.05	0.77
	Instructional support	0.26	**0.24**	0.21	0.28	
	Instructor innovation	0.44	**0.23**	0.20	0.26	
Learning satisfaction	Instructor performance	− 0.36	0.01	− 0.02	0.05	0.77
	Instructional support	0.44	**0.25**	0.22	0.28	
	Instructor innovation	0.22	**0.23**	0.20	0.26	

Bold items showing significant mediation effect.

Self-efficacy was positively related to students' perceived learning outcomes ($\beta = 0.59$, $p < 0.001$) and learning satisfaction ($\beta = 0.60$, $p < 0.001$). The effect sizes of these associations were at medium and large levels.

Mediation Analysis

Mediation analysis based on 5,000 bootstrapping samples was conducted using AMOS 22.0 to estimate the mediation effect of student ASE on the relationships between the instructor's role and the dependent variables (students' perceived learning outcomes and learning satisfaction). The effect size of the mediation was measured by the point estimate of the indirect effect. Hayes (2009) suggested that an indirect effect is significant if 0 does not lie between the lower and upper bounds of the 95% confidence interval. The results of this study's mediation analysis, summarized in **Table 3**, indicated that students' ASE significantly mediated the influence of instructional support and instructor innovation on perceived learning outcomes and learning satisfaction. These mediation effects were medium-sized. However, the mediation effect of student ASE on the relationships between instructor performance and students' perceived learning outcomes and learning satisfaction was not significant.

DISCUSSION

The purpose of this study was to examine the relationships between the perceived role of the instructor and the learning outcomes of university students in cloud-based virtual classrooms in mainland China. The results revealed the positive influence of instructional support and instructor innovation and the negative influence of instructor performance on students' perceived learning outcomes and learning satisfaction. Student self-efficacy mediated the influence of instructional support and instructor innovation on students' perceived learning outcomes and learning satisfaction. The results enhance understanding of the role of instructors in student learning outcomes in synchronous learning environments and suggest ways to foster desirable learning outcomes, especially in higher education settings.

The Relationships Between the Role of Instructors and Students' Perceived Learning Outcomes and Learning Satisfaction

The observed positive effect of instructional support on students' perceived learning outcomes is consistent with the findings of previous research on online learning environments (Mullen and Tallent-Runnels, 2006; Martin et al., 2018). Despite wide acceptance of the positive role of instructional support and adequate access to that support, research has indicated that it is particularly important for instructors, especially in online learning environments, to provide timely feedback for and communicate promptly with students to ensure that students receive the proper knowledge and feel

FIGURE 1 | SEM model results showing significant regression paths. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; goodness-of-fit indices: χ^2 = 8081.57, df = 262, $p < 0.001$, CFI = 0.95, TLI = 0.94, RMSEA = 0.064.
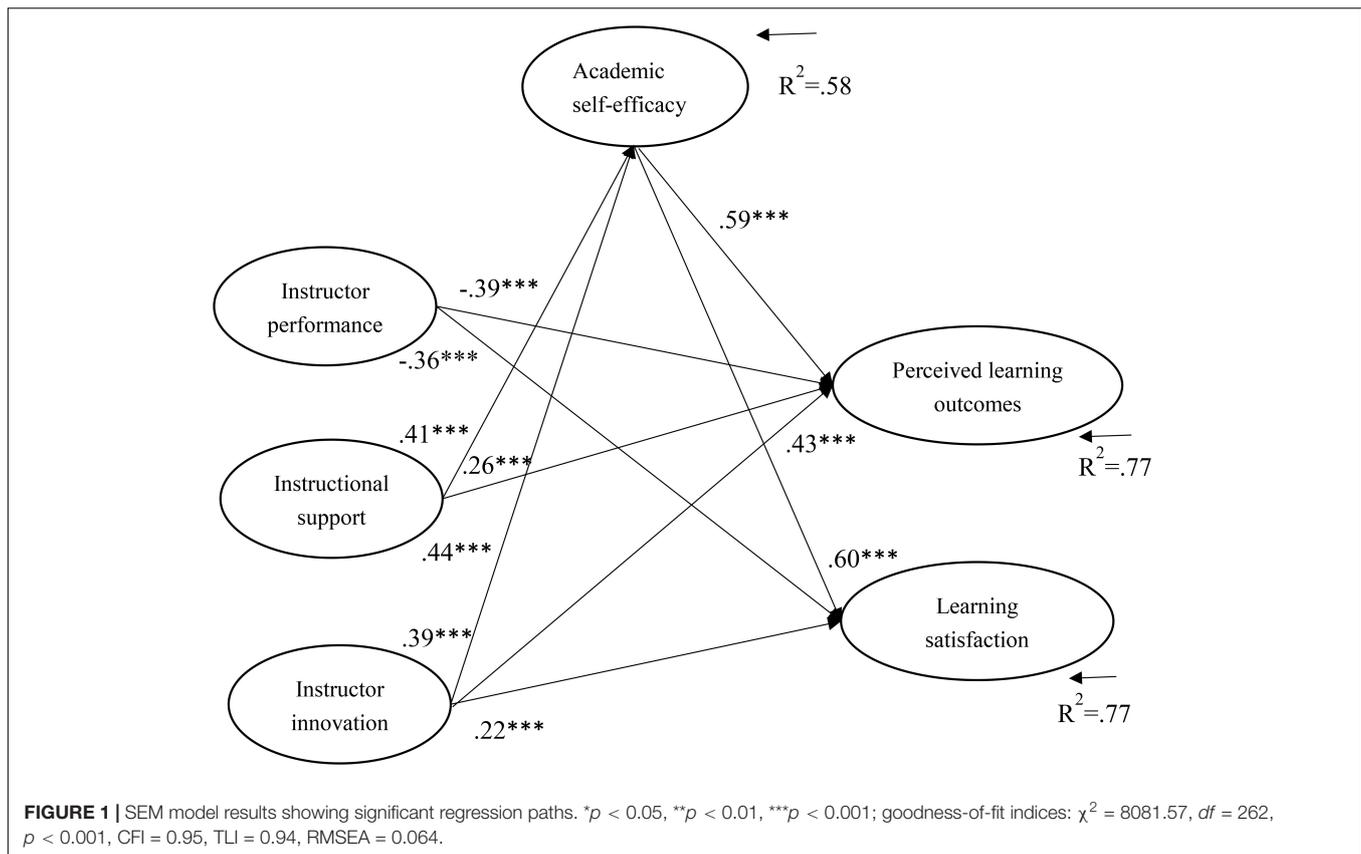
supported (Lee et al., 2011; Martin et al., 2019). In synchronous online learning environments, cloud-based technology, such as Rain Classroom (a cloud-based synchronous online learning application commonly used in China, providing bullet-style subtitles), Tecent Docs, and WeChat, has been found to support instructors' provision of timely feedback and communication, offering developmentally appropriate experiences that enhance students' behavioral and cognitive engagement (Xu et al., 2020).

This study revealed no significant relationship between the level of instructional support and students' learning satisfaction. This finding is inconsistent with studies that have demonstrated the positive effect of instructional support on learning satisfaction in online learning settings (Mullen and Tallent-Runnels, 2006; Lee et al., 2011). Research has identified two types of instructional support—academic and affective support—as crucial in developing students' appropriate learning experiences and promoting their learning, particularly in online settings (Lee et al., 2011). However, a further review of the items measuring instructional support in this study revealed that only instructional academic support was relevant. A possible explanation for our finding is that this single type of support may be suitable only for students who prefer instructor-supported learning experiences (Lee et al., 2011).

The observed positive relationship between students' perceptions of instructional innovation and their learning satisfaction echoed the findings of Lee (2011). Unlike Lee, however, this study reported an insignificant relationship

between instructor innovation and students' school grades but revealed a positive relationship between students' perception of instructional innovation and their perceived learning outcomes. Although both students' perceived learning outcomes and school grades are key criteria used in course evaluation (Kruger and Dunning, 1999), students' perceptions of learning outcomes can provide valuable insights to inform course development (Rundle-Thiele, 2005). The beneficial effect of instructor innovation does not necessarily translate into an improvement in students' grades (De Ketele, 2002); however, the results of this study provide evidence that instructor innovation improves students' learning outcomes in synchronous online settings. Moreover, the results echo the finding of previous research that instructor innovation designed to readapt student learning, improve communication with students, and engage and support students was connected to improved student learning and satisfaction (Walder, 2014). In cloud-based virtual classrooms, therefore, it is crucial for instructors to make good use of cloud computing tools (e.g., Rain Classroom, Tecent Docs, or WeChat) to engage students in meaningful and playful ways to achieve their learning goals. The required innovations in teaching practices resulting from the use of new cloud computing technology are the main barriers to instructors (Al-Samarraie and Saeed, 2018).

This study revealed a significant negative relationship between instructor performance and students' perceived learning outcomes and learning satisfaction in cloud-based virtual classrooms. Most previous research has revealed a significant

positive relationship between instructor performance and students' learning satisfaction in asynchronous online learning settings, indicating the need for experienced professional instructors to improve students' learning satisfaction (e.g., Ali and Ahmad, 2011). However, some researchers have argued that the relationship between instructor performance and students' learning satisfaction may be more complex because of effects arising from their subjective feelings. Rundle-Thiele (2005) indicated that students' ratings of teaching were lower when they felt that their learning workload and obstacles were greater. Blazar (2018) also suggested that teachers who are skilled in improving students' achievement may reduce students' happiness or engagement in class. Therefore, even if instructors' performance is favorable, students may feel less satisfied if their learning workload increases.

ASE as a Mediator of the Relationships Between the Instructor's Role and Students' Perceived Learning Outcomes and Learning Satisfaction

This study extends knowledge of the effects of students' ASE from traditional face-to-face classroom learning and asynchronous online learning to cloud-based virtual classrooms. The results revealed that students' ASE mediated the influence of instructional support and instructor innovation on students' perceived learning outcomes and learning satisfaction. This indicates that students' ASE can increase the extent to which students' perceptions of the instructor's role explain their online learning outcomes. The results of mediation analysis revealed that the mediation effect of ASE was medium-sized. Thus, the direct effects of instructional support and instructor innovation on students' perceived learning outcomes and learning satisfaction were significantly actualized by the students' increased ASE in cloud-based virtual classrooms.

Although very few studies have explored the relationships between these variables in synchronous learning environments, important evidence has been provided that instructional support enhances student ASE in asynchronous online learning environments (Schmidt and Ford, 2006). Synchronous online learning tools facilitating students' anonymous participation in activities and instructors' timely feedback, such as bullet subtitles and instant feedback on course content in Rain Classroom, have been widely used in higher education in mainland China since the outbreak of COVID-19. Researchers have suggested that scaffolding learning using cloud computing tools can develop learners' knowledge construction and mastery experiences (Azevedo et al., 2005; Baanqud et al., 2020), which are among the key sources of self-efficacy. The use of these scaffolding tools supports students' ASE in online learning by helping them to overcome anxiety and increasing their interaction and engagement with the course material. However, these outcomes are mainly dependent on the online instructional design (Castro and Tumibay, 2019). Therefore, university students' perceptions of instructional support and instructor innovation are strong predictors of their ASE in online learning, which in turn fosters desirable learning outcomes and learning satisfaction.

The results of this study also revealed a positive relationship between student ASE and learning outcomes and learning satisfaction in synchronous online learning environments. This suggests that university students with greater ASE are more likely to perceive better learning outcomes and be more satisfied with the teaching and learning process. It should be noted that although student ASE has commonly been found to significantly predict academic success in online learning (e.g., Tsai, 2011), a few studies have indicated that ASE does not predict Internet-based learning success (e.g., Yukselturk and Bulut, 2007). However, based on their qualitative analyses of interviews with instructors, Yukselturk and Bulut (2007) maintained that ASE may still affect learning success. Nevertheless, additional work in the field is necessary to reveal the effect of ASE on learning outcomes, particularly in synchronous learning environments.

Despite the large effect sizes of the direct negative effects of perceived instructor performance on students' perceived learning outcomes and learning satisfaction, the results of the mediation analysis revealed no significant mediating influence of student self-efficacy on those relationships. Similarly, instructor performance was not significantly related to students' self-efficacy, suggesting a significant direct effect of instructor performance on students' learning outcomes and satisfaction. As research on the role of teachers in promoting students' self-efficacy in online learning settings is limited, more research is expected in the near future to explore other potential relationships between the variables, particularly in cloud-based virtual classrooms.

Limitations of the Study and Directions for Future Research

This study offers several insights into the relationships between students' perceptions of the role of their instructors and their own learning outcomes in cloud-based virtual classrooms in mainland China. Some limitations, which indicate directions for future research, should be noted. As the design of the study was cross-sectional, a supplemental longitudinal study may be required to confirm the consistent causal relationships between the variables. The results of this study were based on the self-reports of university students, who might have either exaggerated or underreported their perceptions for a number of reasons. Using multiple methods, such as a mixed-methods design, could yield more objective material data. Based on Bandura's social cognitive theory (1982), the triadic reciprocal causation among environment, behavior, and personal factors suggests that there are various possible models of the interaction effect between the role of the instructor, ASE, and learning outcomes. Accordingly, further investigation of the interaction effects among the three variables is required to gain deeper insights into these interrelationships.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

This study investigated the relationships between university students' perceptions of instructor performance, instructional

support, and instructor innovation and their perceived self-efficacy, learning outcomes, and learning satisfaction in cloud-based virtual classrooms. Students' perceived learning outcomes and learning satisfaction were found to be positively related to instructor innovation but negatively related to instructor performance. Instructional support was positively related to perceived learning outcomes but not directly related to learning satisfaction. Student self-efficacy significantly mediated the effects of instructional support and instructor innovation on students' perceived learning outcomes and learning satisfaction. The results of this study have several implications for improving university synchronous online learning environments and student learning outcomes.

The positive relationships between university students' perceptions of instructor innovation and students' perceived learning outcomes and learning satisfaction highlight the important role played by instructors in facilitating desirable outcomes in online learning environments. Al-Samarraie and Saeed (2018) suggested that the main barrier to instructors in online learning settings is a lack of competence with the relevant technologies. Instructors should be encouraged to take advantage of synchronous online teaching tools during course design, assessment and evaluation, and facilitation to provide more instructional support for students' learning process. Specific strategies include timely response and feedback, increased instructor availability and presence, timely communication with students, and innovations in online course design and teaching practice. Such practices support collaborative learning by stimulating online discussion and creating a more favorable learning environment with improved learning outcomes that match educational goals (Martin et al., 2019).

The positive relationship between students' perceived instructional support and learning outcomes indicates that during online course design, assessment, and evaluation, instructors should consider providing multiple forms of support to meet students' needs and facilitate their online learning. This may enable students to access a learning experience tailored to their learning styles. In addition, the potential detrimental effect of students' perceptions of instructor performance on students' perceived learning outcomes and learning satisfaction should not be neglected; it highlights the need to assign an appropriate learning workload and be aware of difficulties faced by students. In addition, course designers should consider students' needs, and faculty should use a variety of assessment methods, such as

rubrics, peer review, and learning analytics, to assess students and ensure that their workload is reasonable (Martin et al., 2019).

Finally, the significant mediation effect of self-efficacy indicates that improving students' self-efficacy may enhance the beneficial effect of their perceptions of the instructor's role on online learning outcomes. Evaluations of online teaching and learning could thus incorporate ratings of students' confidence in the success of their online learning and instructors' recognition and appreciation of students' ASE in online learning.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the University of Shandong. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All the authors contributed to the study design and approved the final version of the manuscript for submission. CL and HX collected the data. JH and RW analyzed the data, drafted and revised the manuscript.

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Academic Leadership in the Time of COVID-19—Experiences and Perspectives

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The COVID-19 pandemic has been a sharp reminder that large scale, unpredictable events always bring about profound changes with significant consequences on many levels. In light of lockdown measures taken in many countries across the world to control the spread of the virus, academics were "forced" to adapt and move to online settings all teaching, mentoring, research, and support activities. Academic leaders in higher education had to make decisions and to act quickly how were they to manage large educational communities, addressing students', teachers', and staff's needs, as well as society's needs. Using an inductive approach, our study seeks to highlight the main challenges faced by university leaders and to understand their responses to those challenges. The current study aims to investigate perceptions and experiences of academic leaders in a University in Romania during the COVID-19 pandemic. Our foci were the processes underlying their leadership decisions and actions during the second part of the 2019–2020 academic year. Data was collected through semi-structured interviews with 11 university and faculty leaders in Babeş-Bolyai University, Romania. The findings from the thematic analysis revealed three main themes emerging from participants' responses: "the leader's personal attributes," "unity through decentralization," and "opportunities to reinvent the university." Good practices to manage academic institutions in times of crises and changes are discussed, along with insights into strategies for supporting higher education development during crisis and post-crisis times resulting into recommendations for increasing management effectiveness.

Keywords: academic leadership, COVID-19 adaptability, distributed leadership, opportunities, qualitative research, thematic analysis

INTRODUCTION

The COVID-19 pandemic brought several unpredictable challenges worldwide, forcing people to design and implement flexible solutions in order to adapt to the new reality. The crisis had a strong and deep impact on higher education at all levels. Due to the complexity of higher education institutions and their multi-faceted mission of teaching, conducting research, and contributing to society, managing change in academia during COVID-19 became a profound challenge for leaders.

Moving all the educational activities online showed that many universities already had all the tools and resources necessary for digitalization and for implementing effective decisions (Strielkowski, 2020). Academic leaders are increasingly tasked with making day-to-day critical decisions that will shape the future of their institutions. Additionally, in light of the urgent and dramatic shifts, and needs which arose in the last few months, universities have been confronted with various new issues and obligations toward students, staff, and academic audiences.

Thinking ahead, this pandemic period could be the restart button that higher education needs. It might be an opportunity for universities to recalibrate their organizations and to build a more efficient, accessible, and adapted set of offerings to the knowledge-based society in the post-pandemic world of work. Therefore, the main goal universities should assume is to be ready to increase their community impact in a competitive environment.

In the process of designing future universities, academic leaders will play an essential role. Given the increased complexity and diversity of situations that require immediate solutions, academic leaders will be making innovative decisions and responding to the needs (Al-Dabbagh, 2020). In the middle of such a acute crisis as the COVID-19 pandemic, the leaders act under high psychological pressure, with great expectations from members of various organizations for constant reassurance and support. Moreover, the pressure of time, ambiguity, the lack of information, and high level of stress, all increase the difficulty of the decision-making process. In this context, a wise leadership can help the organization become antifragile and resilient (Taleb, 2012), developing in the middle of a crisis through creative thinking, learning fast from experience of and adapting to the crisis, and through decentralized decision-making processes.

Making decisions in times of crisis requires great leadership competencies. Hence, analyzing the perceptions and experiences of academic leaders as decision-makers in a university may provide valuable insights about the decision-making process in complex educational institutions during major crises, such as the COVID-19 crisis.

Academic Leadership

As a large institution, a university is governed by diverse structures and management bodies, from Rector, Vice-Rectors, and Deans to academic councils, department directors, administrative boards etc. Due to these particularities, academic leadership refers to different management roles and titles, varying from strategic management, administrative roles to transformational and visionary roles (Settles et al., 2019). Even in normal times, coordinating all those decision-makers for a common goal, can be very difficult. Many scholars investigating leadership in higher education proposed different models to conceptualize the dimensions of academic leadership. The model proposed by Ramsden (1998) describes the complexity and diversity of roles that leaders in higher education have. Moreover, that model shows the different levels of leadership in a university. According to Ramsden, there is a leadership dimension related to teaching, an effective leader should inspire his colleagues to feel excited about learning and to make good decisions about the educational process. Secondly, there is leadership related to the research dimension of a university, emphasizing the role of producing relevant knowledge assumed by higher education institutions. The next dimension in the model is related to strategy, vision, and networking, and focuses on setting a direction and advocating for it. Thus, an effective leader needs to formulate a clear vision for how to achieve that goal, which will provide a set of expectations as well as intrinsic motivation for colleagues (the latter being the main driving factor of academics). Additionally, this vision needs to be advocated eloquently to the rest of the university, in order to obtain the resources needed to implement it. At the same time, Ramsden focuses on another three aspects of leadership: the motivational dimension, recognition and interpersonal skills, and notes that a good leader needs to be able to lead both from the front (by example) as well as from the back (by recognition and support).

Characteristics of Effective Academic Leadership in Crisis

According to the crisis management model proposed by Nathanial and Van der Heyden (2020) and applied to the COVID-19 crisis, there are some steps that every leader should be aware of in order to be effective in managing the crisis. In the initial phase, it is important to frame the crisis correctly and to communicate as early as possible the paths and methods that will be followed to manage the crisis. At the same time, the exploration of the problem together with different experts and formulating a clear strategy with well-defined indicators are important steps in managing the crisis. Next, the leader should communicate the decisions and the chosen scenarios, and then commit to action. Then comes the execution focus and constant monitoring of the actions. Finally, evaluating, learning, and adapting the efforts according to feedback is essential.

Beside the above-mentioned model of crisis management, some recent studies on leadership during the COVID-19 pandemic highlighted the most essential leader characteristics that bring effectiveness in time of crisis. Koehn (2020) proposed four key-competencies for an effective leader: providing meaningful roles, focusing on learning experiences, emotional agility, and acknowledging fear. Schwantes (2020) also mentioned four competencies needed to overcome the challenges associated with the COVID-19 crisis: flexibility, accounting for emotions, attention to other opinions, engagement. Dirani et al. (2020), emphasized some important roles and traits leaders should have in times of crisis: to be a sense maker, to be a technology enhancer, to have emotional stability, and to emphasize employee well-being and innovative communication in order to maintain the financial health of the organization.

Regarding academic leadership, the most important feature of leadership during the COVID-19 crisis that emerged in the latest publications on this topic brings distributed leadership to attention (Fernandez and Shaw, 2020). Usually, a university is a large institution with many faculties and departments, so a leader acting alone cannot succeed in a time of such a difficult crisis. The academic leader should be the one setting the strategy

and the institutional priorities and at the same time giving their team the autonomy to assume the responsibility of their own decisions based on the specificity of their faculties/departments. Such a distributed leadership can be more effective in improving the quality and rapidity of decisions while increasing the sense of empowerment and motivation of each team (Kezar and Holcombe, 2017). The challenges of such a complex period require that top leaders engage in a explicit delegation of leadership that values the leadership potential of the people in their organization.

The academic decisions of shared leadership helped universities find solutions adapted to the crisis and to make local decisions benefiting from greater organizational agility, innovation, collaboration, and shared support (Fernandez and Shaw, 2020). A shared leadership paradigm helps a university to respond to a crisis through distributed leadership and an increase in responsibility at any organizational level (Kezar and Holcombe, 2017). Moreover, distributed leadership means making connections between people at all levels of the organization facing the challenges of a crisis and allows the transformation to be felt as meaningful for everyone. Moreover, it promotes psychological safety in the organization. So, the role of leaders is crucial in guiding the institution through finding the most appropriate solutions for empowering, developing a culture of trust, and orienting toward solutions that lead to effective results (Kezar et al., 2018).

At the same time, disrupting organizational norms, displaying courageous decisions, and engaging in proactive adaptation helped the transition from face-to-face activities to online, remote education. Academic leaders who see crises as strategic opportunities for innovation and using new technologies and techniques are the ones that bring the best results and practices. Effective leadership in crisis means risk taking, courage, flexibility, orientation toward goals and solutions, strategic vision and using an innovative approach meant to gain competitive advantage (Fernandez and Shaw, 2020). Leaders with great flexibility and adaptability and the capacity to perceive a crisis as an opportunity are effective in their decisions and have a strong capacity to navigate through uncertainty and to learn from experience (Ancona et al., 2007).

Due to the specificity of the COVID-19 crisis, which brings a lot of stress and uncertainty, the leader's personality characteristics and leadership style are also very important for building trust and accountability in the organization. From this point of view, a servant leadership emphasizing a collaborative, empathetic, emotionally stable leader personality can help build a strong community through commitment to the needs of the organization's members (Doraiswamy, 2012). A servant leader also focuses on the motivational and aspirational aspects and recognizes followers' need for psychological support and belonging (Eva et al., 2019), which suggests that if followers are treated as ends in themselves, rather than a means to an end, they will reach their potential and so perform optimally even in crisis (Waterman, 2011).

Organizational factors are equally important in facilitating effective solutions in response to crisis challenges. Making effective decisions in crisis means building organizational resilience. A resilient university is one that adapts and improves its responsiveness to challenges through absorbing adversities and going further (Dirani et al., 2020). The organizations that respond efficiently to crisis and changes are the ones that develop a culture of flexibility, learning from experiences, and orientation toward understanding the specificity of situations and of employees' issues (Caminiti, 2020). Moreover, an adaptative university is oriented, through accepting unpredictable contexts and finding ways to transform them into opportunities, toward sharing their own values and having an impact on their communities.

The characteristics of leaders and organizations we presented above, can offer a better picture for increasing the effectiveness of leadership in crisis, but they should be investigated in a more comprehensive framework. Due to the unpredictable and dynamic character of COVID-19 situation and our qualitative nature of the design, the meta-theoretical framework we adopted for our study is Complexity Leadership Theory (Uhl-Bien et al., 2007). This theory frames leadership as a complex, dynamic, and interactive relationship between leaders' organizational and situational factors, focusing on enabling adaptivity, learning and innovation in within a context of knowledge-based organizations (Uhl-Bien et al., 2007). Moreover, that theory emphasizes the idea that leadership strategies are embedded in context, with leaders valuing their characteristics to shape the dynamic emergent processes, in order to face the adaptive challenges requiring new patterns of decisions. More specific, the main leadership functions derived from those processes are adaptive, administrative, and enabling, interacting one to each other to every level.

Rationale and Aim of the Study

There is a research gap regarding effective leadership of academic leaders in crises, especially in higher education. Recently, a few studies have been published investigating aspects of academic leadership in the COVID-19 pandemic. For example, Strielkowski and Wang (2020) investigated the way lockdown and restrictions have impacted higher education in the Czech Republic such that the forced digitalization resulted in a somewhat technological revolution. The paper also describes the implications of the COVID-19 pandemic for academic leadership, outlining predictions and provisions. In another study on academic leadership, Sá and Serpa (2020) have studied the opportunity provided by the current situation to reshape the higher education system in Portugal, discussing the role of leadership in digital development and the transformation of academic organizational culture. Suggestions for the reconceptualization of teaching methods, leadership models, communication channels and other useful insights and strategies are offered by the authors in a comprehensive manner that seeks to help tackle challenges and embrace opportunities.

Even though there are some valuable research contributions to the literature of academic leadership, the need to understand the characteristics and specificities of decisions made by leaders in higher education during the COVID-19 pandemic is important in order to understand and plan the effective development of universities for the future.

Therefore, we aim to provide a better understanding of academic leadership in crisis through a qualitative approach underlying one university's top academic leaders' experiences during COVID-19. We took a case-study approach and focused the investigation into one institution, Babeş-Bolyai University, in Romania. This was necessary to enable the analysis and to take into account the particular mission, values and specificity of academic environment and to make links between these and the leadership experiences and decisions. Moreover, the organizational case study approach brings value by undertaking an investigation into a phenomenon in its real context (Rowley, 2002).

Babeş-Bolyai University (UBB) in Cluj-Napoca is one of the oldest and largest universities in Romania (45.000 students). UBB occupies the highest position among the Romanian universities (in the National University Metaranking), being classified as an "advanced research and education university" by the Ministry of Education and as an "international university, with excellence in teaching and research" by The British QS STAR. UBB was also granted the "HR Excellence in Research" award in 2018 and has joined in 2020 the prestigious GUILD organization. One characterizing element of the university is the linguistic and cultural diversity, reflected in the carrying out and coordination of its educational activities, having three major lines of study (Romanian, Hungarian and German, plus other international languages in some of its schools), with 22 faculties offering 300 study programs in bachelor's, master's, and PhD degrees, as well as advanced postgraduate studies, from which students can freely choose. As a comprehensive university aiming at advanced research and education, UBB complies with the general mission of generating and transferring knowledge. Assuming these goals, the university is considering a strategic management plan and an efficient teaching plan, a balanced global development of the institution, adequate decision-making, ensuring democracy, collective participation, and transparency, and last but not least, assuming a set of quality principles that guide all activities within UBB. The university incorporates and advocates for the following values: tradition, excellence, freedom of expression, truth-seeking, integrity, equity, social responsibility, respect toward diversity, and intercultural cooperation. Regarding rectorship, the Hungarian and German lines are represented by one deputy Dean and one general deputy secretary, and in the Senate by one of its Vice-Presidents. The rectorship management office of the university is made of 1 Rector and 10 Vice-Rectors, working in unity to ensure the advancement and growth of the institution on several areas of development: administration, human resources, alumni, career and counseling, socio-cultural component, public relations and international relation, research, development and innovation, digitalization, patrimony, etc. All of these offices, together with the Deans of each faculty, the Council for Doctoral Studies Director, the representative of the General Administrative Directorate, and the students' prefect constitute Babeş-Bolyai University's Board of Directors.

Given the complexity of Babeş-Bolyai University, its academic leaders' reflections on the decision-making process and the results obtained during the COVID-19 crisis can bring insights into understanding leadership in higher education institutions.

More specifically, the objective of our research was to investigate perceptions and experiences of 11 academic leaders during the COVID-19 challenges, in order to understand the processes underlying leadership decisions during the second part of the 2019–2020 academic year.

Consequently, we aim to answer the following research questions: (1). What were the main characteristics of effective academic leadership during the COVID-19 challenges? (2). Which were the individual and organizational factors that facilitated leaders' decisions during the COVID-19 challenges?

MATERIALS AND METHODS

Participants

The invitation to participate in this study was sent to all the Deans and Vice-rectors [*NB—this is the equivalent of Vice-President or Pro-Vice-Chancellors*] from Babeş-Bolyai University. The interviews were conducted with those who responded to that invitation in the time allotted to the study. Specifically, the data was collected from 11 academic leaders (5 Vice-Rectors and 6 Deans) from Babeş-Bolyai University, Romania. Two of them were women and nine men, ranging in age from 34 to 62 and having over 5 years of experience in academic leadership positions. All the participants were Associate Professors and Professors, having an academic background in the fields of: Biology, Business, Communication and Public Relations, Economics, History, Mathematics and Psychology. Their involvement in the study was voluntary, based on their available time and willingness to participate in the interview. They were informed about the interview's purpose, how it will be conducted, the estimated length of time it might take, and the confidentiality of the responses. Informant consent was obtained from every participant.

Measures and Procedure

A semi-structured interview guide was developed with nine questions that explored the visions, strategies and actions taken through the lenses of personal and organizational effectiveness. The interviews were conducted in October and November 2020 and the participants were framed to respond by referring to their academic leadership experiences from March to October. Interviews lasted between 20 and 35 min and were conducted and moderated by the investigator. The discussions were audio recorded, transcribed verbatim and checked to ensure accuracy.

Data Analysis

We authors analyzed the transcripts using the inductive thematic analysis based on the guidelines suggested by Braun and Clarke (2006), focused on the semantic and essentialist approach. Each of us conducted separately a systematic and independent analysis through the entire data. Both authors read the transcripts several times in order to generate the initial codes, then transformed them into potential themes. After checking the themes in relation with the codes, they were refined. Based on diagramming techniques, the themes and subthemes were clustered. In the final step, the most relevant excerpts from the interviews were read and checked again against the research questions and

existing literature. To present the findings through excerpts and to maintain the confidentiality of the responses, we coded the participants with *Dean* and *Vice-Rector*, followed by a number from 1 to 5 for Vice-Rectors, and 1 to 6 for Deans.

RESULTS

The thematic analysis revealed three main themes that emerged from participants' responses: "the leader's personal attributes," "unity through decentralization," and "opportunities to reinvent the university." In the section below, we present each of these themes, the subthemes we identified for each of the themes and example quotes from the interviews. We also discuss the theme and subthemes according to participants' academic background and managerial role (Vice-Rector and Dean).

The Leader's Personal Attributes (Theme 1)
The first powerful theme that emerged from the participants' responses is related to essential personal characteristics of the leaders which underlined the leadership experiences during the first 6 months of the COVID-19 pandemic. The subthemes we extracted are responsibility, the power of experience and adaptability to changes. Those three personal attributes of leaders emerged as central for academic leadership in the perception of our participants.

Firstly, responsibility, seen as a catalyst for effective leadership, is expressed concisely and directly by these responses:

"*The ability to transform and acknowledge the responsibility you have*" (Dean 3).

"*Our long-term vision is to empower every decision maker to do their job without passing it down to someone else*" (Vice-Rector 3).

"*And considering the present circumstances [the current context] whoever is in a leading position nowadays is bound to take over some responsibilities without passing them down to the others, without delegating those partial decisions or responsibilities they are otherwise legally accountable for and should therefore, assume*" (Dean 4).

"*And a change that brought, let's say, a little reluctance and maybe dissatisfaction among some colleagues was the idea of making everyone responsible to a higher degree*" (Dean 5).

Secondly, previous leadership experience has been perceived as an effective factor in dealing with the pandemic:

"*I believe part of my professional experience in the field of communication has considerably helped uproot myself from this traditional sphere*" (Dean 2).

"*Experience helped me in the first place*" (Dean 3).

"*I think that this experience [i.e., as head of department] has greatly helped me in general: I would address certain issues no matter how complicated they might have seemed at the time. I have gained the necessary, even if insufficient, experience to start from somewhere and to face certain things*" (Vice-Rector 5).

Thirdly, adaptability (an adaptable mindset) was also an important personal factor perceived as effective in dealing with various administrative, teaching, research, and communication situations:

"*So, whatever the challenges, we have the ability to adapt and UBB has the ability to adapt from this point of view, because this is what defines us*" (Dean 4).

"*The flexibility it has shown. So, I think it was very important that in moments like these we did not proceed in a stubborn way... they expedited the development of the admission app and similar solution, which were hardly perfect, but, in the end, proved functional... we can't ask for perfection, especially when everything happens in the context of overnight crisis... Even then we still saw this flexibility, yes... people might have rejected these things. But we've accepted the challenge of exploring uncharted waters*" (Dean 1).

"*Redrafting all the regulations pertaining to my portfolio, in light of the current situation, rethinking them so that we can include all the possibilities that may arise due to the pandemic*" (Vice-Rector 1).

Unity Through Decentralization (Theme 2)
The second theme which emerged from the responses is Unity through decentralization, revealing a community dimension of academic leadership, balancing autonomy with togetherness. The main subthemes refer to: setting the direction through guidelines, the autonomy of the faculties, and teams' power.

Firstly, the leadership process was characterized by the fact that the Rectorate set the direction through guidelines. This aspect was perceived by the respondents as a valuable asset of the university:

"*We all pull in the same direction, in other words, we try to manage this situation, we accept that this is what we have to deal with, and we are all part of the same team. I've never felt that each person wants something different. There was a shared goal, so to say*" (Dean 3).

"*We've managed to tune our endeavors well, to act and speak as one: there were no absurd voices of dissent, arguing just for the sake of arguing against quite clear decisions that had to be taken drastically*" (Dean 2).

"*There were some rules that still had to be followed. When a faculty had made a decision, it had to await the confirmation of the upper management before implementation*" (Vice-Rector 1).

Secondly, the autonomy dimension was relevant for meeting the specific needs of the faculties:

"*Perhaps this was the wisest decision issued by the Rector's office: to give the faculties the choice of either going online or teaching face to face*" (Dean 5).

"*The autonomy we had in deciding, as a faculty, whether to go online or face-to-face. In other words, respecting the singularity of each faculty guaranteed the consistency of a decision we had taken and complied with. And this was a positive thing because I felt that we could contribute to the welfare of the University*" (Dean 1).

"*The fact that each faculty was allowed to choose a flexible or hybrid scenario for this period of teaching activities. And there was no imposition of a consensus: everyone in a certain way. That is, each faculty and each management team knows exactly which resources are available or how willing the teaching staff is to commit to face-to-face activities. The fact that we were allowed to put these things into perspective and make our own decision seemed extraordinary to me*" (Dean 4).

"*The first and most important aspect is the mindset. The philosophy or the approach that the university board endorsed: to create general frameworks so that each faculty can make a specific decision that would facilitate a better control over and organization of activities. Should things go adrift, we try to put them back in place, but we always give the faculties enough wiggle room to act and think for themselves*" (Dean 3).

Thirdly, the power of the teams was highlighted by all respondents, emphasizing the importance of trust in others' competence and collaboration.

"*Eventually, I hope my colleagues and I have managed to concur on encouraging each and everyone to bring something on the table*" (Dean 2).

"*There are certain people I can collaborate with, because they have the proper approach. They also possess the right energy, the necessary strength and responsibility, that is clear. But for this, I wouldn't be successful.... I can be brilliant, but that is all. In the end, a collaborative environment is what matters*" (Vice-Rector 5).

"*We shifted into high gear, we have been working under pressure and stress ever since March, but we have done this together, which alleviated some of the pressure we felt. The result was that we managed to streamline all legal regulations so that they could be applied by everyone*" (Vice-Rector 3).

"*One aspect that helped me a lot was the top management's confidence that my team and I would have the ability to coordinate things well*" (Dean 3).

"*I trust the people I coordinate, and I take the responsibility for each decision upon myself. This is very important*" (Vice-Rector 4).

Opportunities to Reinvent the University (Theme 3)

The third theme revealed more of a community dimension of leadership, focusing on the capacity of the university to become resilient and to grow in a post-pandemic world. Responses reveal two subthemes related to the future: the university's legacy for tomorrow and its openness to change.

Firstly, the university's legacy for tomorrow, as reflected by the actual practices implemented throughout the university for the pandemic situation, is perceived as being valuable for application even in non-pandemic conditions:

"*I believe that many of the things we have acquired now will be put into our everyday practice... all the networks we have created must, undoubtedly, be reinforced*" (Dean 2).

"*I believe that some changes could not have been possible, were it not for the Covid situation. I look upon the present time as one that fosters change, and change is certainly a prerequisite for adaptation... somehow, people understood that they have to embrace change*" (Vice-Rector 3).

Secondly, openness to change was perceived and experienced as an essential dimension of the institution facing the challenges:

"*I can say that the pandemic triggered latent ideas, some perhaps less visible to us, in the sense that until now, they did not rise as immediate opportunities: open online courses, workshops which are not only feasible but could also represent effective teaching*

sessions... and these have been long elicited, planned and needed, indeed*" (Vice-Rector 5).

"*This (pandemic) is an opportunity to radically reconsider our view of the educational system... to be able to thoroughly redesign the vision of a Romanian faculty and to share this vision as an example of good practices*" (Dean 3).

"*The present moment and context bring with them a unique opportunity to capitalize on our potential both in the way we understand our development and in the way we steer the progress of a faculty*" (Dean 4).

DISCUSSIONS

The results of our study revealed novel insights about the personal and organizational factors contributing to the effectiveness of academic leaders' activity and decisions during the COVID-19 pandemic and supported the results existing in recent literature.

This research nonetheless probes more deeply into the processes of academic leadership. Analyzing the themes and subthemes which emerged in our research, we can identify processual connections between them. Firstly, there are the leader's personal attributes, emphasizing responsibility and adaptability, and building on previous experiences as a leader. Behind this combination of individual characteristics, we can infer there was a strong proactive attitude and an assumed risk-taking behavior, which helped the leaders find and create meaningful leadership experiences even in crisis (Fernandez and Shaw, 2020). Secondly, the leaders' personal attributes helped the university to adopt the strategy of *unity through decentralization*. Proving responsibility and adaptability, along with the experience, the university's top leaders adopted a strategy that allowed mid-level leaders (Deans) to express their leadership styles, offering them the freedom of action within a given general framework. Deans acted responsibly, identifying viable solutions to continue the activity during the pandemic period. Moreover, decentralization gave Deans the opportunity to create and apply new systems, to communicate in a new way, to find new advantages and solutions in order to be able to continue their activity. Once these new systems, procedures, and solutions were tested and applied, Deans understood their potential even in the post-pandemic period. Therefore, the themes represent parts of the evolution process of the university, but also reveal some differences among Deans and Vice-Rectors.

If we discuss the results of the Deans and Vice-Rectors and take their academic background into account, we can gain a more contextual insight. Vice-Rectors have insisted more on the attribute of responsibility. A possible explanation could be the fact that Vice-Rectors are more aware about the importance of the leadership experience and engaged in their work duties of setting the general framework for all the faculties. On the other hand, the Deans emphasized the power of personal adaptability, more than Vice-Rectors. Those differences can be explained through the fact that while the Vice-Rectors' tasks were to implement all the national laws and measures and to create an effective framework, whereas the Deans had to find ways to adapt to the specificity of their programs and faculties to that framework.

Another important aspect we observed in the responses is that responsibility is underlined by those respondents with background in Humanities and Social Sciences, more than those in Math and Science. The need of autonomy was also more strongly emphasized by the Deans, with richer descriptions, this being strongly related to their responsibility. On the other hand, the Vice-Rectors insisted more on the power of the teams, reflected in the Rectorate strategy of shared and distributed leadership. Regarding the theme *opportunity to reinvent the university*, there were no notable differences between Deans and Vice-Rectors, but it is worth mentioning that those with background in Business, Economics and Mathematics appeared more interested in this topic, with a specific preference for *openness to change*.

The findings are valuable if we consider that academic leaders are usually elected based on their academic and scientific prestige, not on their managerial background and education, which can be a barrier in the leadership roles (Elena-Pérez et al., 2011). For our participants, an important factor contributing to the internalization of their role, was their previous experience as academic leaders, which can be an important predictor of performance (Fiedler, 1994). Based on the previous discussion, distributed leadership played a crucial role in the university's policy, which enhanced trust and added relevant feedback loops.

Moreover, in allowing faculties to decide and act independently within a given framework, top leaders of the university showed trust in Deans and their actions (Montgomery, 2020). Empowered with trust, Deans conveyed it to their teams, as it appears from the excerpts presented. We notice here a two-way relationship between Rectorate and Deans and Deans and their teams. Thus, trust transcends the three themes: the self-perceived trust of leaders, manifested through responsibility and adaptability, is put into practice (capitalized at the institutional level) through the strategy of unity through decentralization of the university which goes even further, being reflected by the desire to reinvent the university. Consequently, in dealing with the pandemic crisis, the university acted "in the humanist spirit of trust and openness, to generate an organizational culture of solidarity and cooperation" (David, 2020, p. 5). Therefore, the university's values are assumed by its leaders and transmitted further to members. Sharing the same values amplifies collective efficiency and leads to unity in direction.

Trust has its own merits in developing efficient teams. The reverberation of trust facilitates a proactive attitude of the faculty members, which contributes to the increase of the teams' efficiency. This result is supported by the findings of Almutairi (2020) on effective leadership in higher education, which states that through their positive attitude to work, like encouraging innovation and not complaining about difficult tasks, managers increase the performance of faculty members.

The *feeling* of the team and the sense of community was perceived as being a powerful resource for implementing effective decisions and face the challenges, which emphasizes the important role of a distributed leadership and the value of controlling uncertainty through building meaningful actions for university members (Kohtamäki, 2019; Zafar et al., 2019). At the same time, sharing trust and common directions increased the

psychological safety and effectiveness of members from the lower level of the organization (Samoilovich, 2020).

Thirdly, the individuality and the effectiveness of the teams was supported by organizational resilience and flexibility. The participants of our study perceived they were empowered by a general institutional orientation to learn, grow, and develop, despite the challenges. An organization that discovers its internal resources of adaptability and learning becomes more powerful in dealing with environmental demands (De Boer and Goedegebuure, 2009). The pandemic forced leaders to find new solutions, to adapt, and the results did not take long to appear: teaching platforms, new approaches for the teaching process, the advantages of offering education for students all over the world, new intra-university communication channels and so on. These achievements open new perspectives not only for the continued existence of universities, but also for their development.

The pandemic showed us new horizons and forced us to think from a new and innovative perspective. The challenge for academic leadership is how to encourage the necessary skillset and mindset shifts for all who work in higher education (Davis and Jones, 2014).

Furthermore, the current study's results confirm previous leadership theories and findings which conceptualize leadership as a complex process embedded in a social context. The academic leaders' perceptions revealed the interdependence of individual, organizational, and situational factors in supporting their decisions, implemented both on informal (emergent) as well as formal (hierarchical) processes (Bolden et al., 2012).

Even if the academic management roles define specific responsibility, the effective application of management tasks was strongly dependent on leadership self-efficacy (personal attribute), shared trust, common goals and perceiving the change and crisis as opportunity, which created engagement and coherence in the process.

These findings can be a starting point for investigating the complex dynamics of mechanisms underlying academic leadership in time of crisis (Uhl-Bien et al., 2007). Moreover, the themes we derived from the participants 'responses, emphasized the importance of distributed leadership. As previous researchers have stated, distributing leadership can improve effectiveness in a crisis (Berjaoui and Karami-Akkary, 2020) and enable rapid responses and decision making (Kezar and Holcombe, 2017). If we investigate a deeper level, the relations between Deans, Vice-Rectors and Rector, corroborated with the trust of academic community, increased self-efficacy, facilitated an adaptive emotional climate and reduced the resistance to change, all of which seem to be essential for higher education leaders (Heffernan and Bosetti, 2020).

The value of seeing leadership as a dynamic and collaborative process, where the Rectorate articulate the strategic goals and the responsibility is distributed among Deans and heads of departments, as previous authors suggest (Ancona et al., 2007) was strengthened in our study. Although the results of the present research are concordant with leadership studies, they should be discussed in the context academic environment in Romania. Babeş-Bolyai University is a top university in Romania, it has a good internal and public brand, an effective

collaboration with public administration and strong partnerships with key representatives of the social and business environment. Those factors contributed to a sense of empowerment and the trust the academic leaders perceived during COVID-19 crisis. Moreover, the effectiveness of one university's decisions "depends on relations of relative conflict or trust between the university and government and society" (Kai and Li, 2013, p.5) and our university has a great autonomy given by laws and policies, which gave leaders' the freedom to design and implement its own measures. Since "autonomy concerns the experience of acting with a sense of choice" (Hocine and Zhang, 2014, p. 140) and accountability for education and research's quality is correlated with autonomy, acting based on it, is relying on the university values expressed in its organizational culture. Babeș-Bolyai's core values are "tradition and excellence (through rationality and wisdom) in the modern humanistic spirit of trust and openness" (David, 2020, p.1). Being a university with a long tradition, and also a strong orientation toward future excellence, the experienced academic leaders perceived they were able to act accordingly. Last but not least, Babeș-Bolyai University is usually a key actor in providing good practices and models in higher education in Romania. From this point of view, our results can be a starting point for improving academic leadership in other universities.

CONCLUSIONS

This case study and its analysis make a significant contribution to contemporary literature and research on academic leadership. To our knowledge and to date, it is the first study to empirically explore this topic in the context of the COVID-19 pandemic. With this aim to investigate the perceptions and experiences of Deans and Vice-Rectors regarding leadership processes during crisis, our research enriches the understanding over the leadership specificity in the most challenging times in the last few decades. The results discussed above should be seen in the light of the specificity of Babeș-Bolyai University. Academic leadership practices may vary across universities according to their differing organizational culture, tradition, mission etc. Also, our study's limitations are related to the reduced number of participants, their academic backgrounds, and the fact that the sample was based on voluntary participation. Therefore, future studies can address this issue by including more diverse and larger samples.

For a better understanding of the topic the perceptions of other stakeholders (head of departments, administrative staff, students, etc.) should be addressed. Despite these limitations, the findings provide insight into the important dimensions of academic leadership when faced with big environmental challenges. Hence, this paper provided several insights into the interaction and relationships between individual leaders (traits, attitudes, and background), organizational and contextual factors, thus offering a framework for investigating academic leadership from a comprehensive model.

Our findings will inform academic leadership strategies by providing insights into effective dynamic processes of leadership characterized by empowering every person in strengthening the relation between adaptive needs and administrative identity, as embedded in the context (Koehn, 2020). From a practical perspective, this study can contribute to raising awareness of the importance of leadership processes in difficult times and of the needs of leadership training initiatives to foster change, innovation, and adaptation for finding the best ways to address local, national, and global challenges.

The findings can also guide the development of leadership and management tools and recommendations for academics and provide insightful perspectives on the topic. The future is already here, and a new mindset, new attitudes and practices will have to be incorporated into the new reality of universities, effectively harnessing the experience gained during the COVID-19 time.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Babes Bolyai University Ethics committee. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Developing Resilience During the COVID-19 Pandemic: Yoga and Mindfulness for the Well-Being of Student Musicians in Spain

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Here, we report on a quasi-experimental study to explore the applicability and perceived benefits of the CRAFT program, which is based on mindfulness, yoga, positive psychology, and emotional intelligence, to improve higher education student musicians' health and well-being during the lockdown. A subset of student musicians at a Higher Conservatory of Music in Spain followed the CRAFT program during the academic year 2019/2020, 1 h per week as part of their curriculum. Students enrolled in CRAFT-based elective subjects formed the CRAFT program group ($n = 40$), while other students represented the control group ($n = 53$). The onset of the national lockdown elicited by the COVID-19 pandemic occurred halfway through the program, which was subsequently delivered in an online format. We administered an online survey to explore the effect that the exposure to the CRAFT program had in terms of how participants dealt with various health and well-being concerns arising from the COVID-19 lockdown. There was a significantly higher proportion of proactive participants in the CRAFT program group, 92%, than in the control group, 58%, in terms of implementing practices to improve their health and well-being during the lockdown. Additionally, significantly more participants acknowledged perceived benefits from their practices in the CRAFT program group, 78%, than in the control group, 52%. Among proactive participants, yoga/meditation was the most implemented in the CRAFT program group, followed by exercise, and other yoga/meditation practices, whereas in the control group, exercise and Alexander technique-based practices were the most applied. In the CRAFT program group, the highest rate of perceived benefits was from yoga/meditation CRAFT-based practices, 51%, followed by exercise, 32%, and other yoga/meditation practices, 27%, whereas in the control group, benefits were reported by 29% of exercising participants and 16% for those having practiced the Alexander technique. A similar pattern was observed when excluding participants with previous yoga/meditation experience. This study revealed

how participants can independently apply learned skills from the CRAFT program in response to a naturally occurring life event of unprecedented global impact, suggesting that previous exposure to mindfulness and yoga is likely to have a beneficial effect on how young adults react towards exceptionally stressful conditions.

INTRODUCTION

The COVID-19 pandemic has had a detrimental global impact on the health and well-being of a wide range of populations beyond the elderly and other vulnerable people (Aristovnik et al., 2020; Goldman, 2020). Apart from the direct effects due to the viral infection, the lockdown implemented to counter the spread of the disease and the economic crisis triggered by it has also generated further concerns such as decreased physical activity (Ammar et al., 2020), sleep disturbances (Altena et al., 2020; Gualano et al., 2020), and psychological distress (Ozamiz-Etxebarria et al., 2020; Rajkumar, 2020; Rodríguez-Rey et al., 2020; Vicario-Merino and Muñoz-Agustín, 2020; Wang et al., 2020).

In this milieu, it appears that the prevalence of the aforementioned health and well-being concerns has also spread further among young adults undertaking tertiary education worldwide, a type of population that, prior to the onset of the pandemic, already had well-documented issues related to both psychological distresses (Bayram and Bilgel, 2008; Hunt and Eisenberg, 2010; Auerbach et al., 2016; Bruffaerts et al., 2018 Bruffaerts et al. (2018) and physical problems (Hussain et al., 2013). For instance, significant reductions in physical activity of up to 49% coupled with significant increases in sedentary behaviors have been reported among Italian undergraduate students during the lockdown (Gallè et al., 2020a,b). Moreover, worsening of various conditions such as stress, depression, anxiety, negative affect, sedentarism, loneliness, sleep quality, and concerns about family and finances have been found among Greek, Chinese, Swiss, and American university students, either as compared to previous normative data (Kaparounaki et al., 2020; Liu et al., 2020), prior longitudinal data between both the same and different student cohorts (Elmer et al., 2020; Huckins et al., 2020), or even longitudinally (Li et al., 2020). In Spain, a survey completed by 3707 respondents, among which 77% were university students, revealed that 21, 28, and 34% of the sample reported moderate to extremely severe symptoms of anxiety, stress, and depression, respectively (Odriozola-González et al., 2020). Interestingly, the authors found that the highest prevalence of moderate to severe symptoms was scored by students involved in Arts and Humanities studies, a trend that has been previously documented (Lipson et al., 2016) for this discipline to which the sample of our current study – higher education student musicians – belongs.

Under these circumstances, it is reasonable to assume that for higher education student musicians who were already affected by mental and physical disturbances, this unprecedented event and its multifactorial consequences might have aggravated such conditions, negatively impacting, in turn, their lives and academic performance. As it happened with most higher education providers around the world, the onset of the lockdown disrupted the function, management, and structure of all higher conservatories of music in Spain, which, following the Spanish Government declaration of the state of emergency on March 14, started shifting into what has been called emergency remote education (Bozkurt et al., 2020). This adaptation to an online-teaching-and-learning process has added extra challenges and difficulties, overburdening the psychological and emotional pressure of both teachers – who were forced to manage dual parenting-teaching roles – and students. Therefore, if before the pandemic there was already a clear need of designing specific interventions to support higher education students' health and well-being, the emergence of the COVID-19 and its association with the exacerbation of their pre-existing physical and psychosocial issues signified an even clearer rationale for developing such interventions. In line with this, a further inquiry regarding this claim would pose the question as to whether pre-existing health and well-being programs disrupted by the pandemic, yet tailored to be delivered online, have been effective in helping higher education students cope with the severe ensuing demands elicited by the lockdown. The current study partially addresses this research question in the context of higher education student musicians following a health and well-being program – *The CRAFT program* – as part of their curriculum at a Royal Conservatory of Music in the midst of a global pandemic and state of emergency remote education.

The recently developed CRAFT program was specifically devised to promote a holistic education that concurrently considers students' emotional, cognitive, and physical processes to facilitate their learning experience, happiness, health, and well-being (Posadas, 2019). Though applicable to any educational context, the program was originally designed to meet the needs of students involved in specialized higher educational fields such as music, fine arts, languages, and sports. Since its creation in 2016, the program has been implemented in various educational settings and populations, with higher education student musicians at higher conservatories of music being the predominant targets. The program was first applied at the Royal Conservatory of Music of Granada Victoria Eugenia in its preliminary version called *the CRAFT's 7 mindful minutes* in the subjects English for Musicians and Chamber Music during the academic year 2016/2017 (Rull et al., 2019; Posadas and Bartos, under review). In 2017/2018, the program was implemented as part of the academic coursework at the same institution as a CRAFT-based elective subject of Mindfulness, and the following year, the CRAFT-based elective subject of Emotional Intelligence was also added to the curriculum. The program springs from

the theories, philosophical underpinnings, practices, and state-of-the-art neuroscientific findings of yoga, mindfulness, positive psychology, and emotional intelligence. These four disciplines constitute the four foundations of the program and inspired, in turn, the creation of the acronym *CRAFT*, which stands for the following Spanish terms that synthesize the five elements of the program: *Consciencia* (i.e., consciousness), *Relajación* (i.e., relaxation), *Atención* (i.e., attention), *Felicidad* (i.e., happiness), and *Transcendencia* (i.e., transcendence). Therefore, both the four foundations and the five elements represent the framework guiding the practical and theoretical content delivered as part of any syllabus designed for its implementation. In the following paragraphs, we will briefly review some of the latest findings relative to the four foundations of the CRAFT program and their potential beneficial effect for assisting higher education students to cope with the various health and well-being challenges elicited by the lockdown.

There is a growing body of research supporting the effectiveness of mind–body therapies such as yoga and mindfulness to improve various physical, mental, and emotional health-related concerns among higher education students. Not only might yoga-based practices (e.g., yoga poses, breathing, and relaxation techniques) counterbalance the stress response by vagal nerve stimulation and consequent reduction of cortisol and pro-inflammatory cytokines, but they could also enhance markers of psychophysiological health (e.g., blood pressure, heart rate, flexibility, balance, strength, pulmonary functions, and musculoskeletal conditions; Raub, 2002; McCall, 2013; Sullivan et al., 2018a). Moreover, yoga and mindfulness meditative practices might improve cognitive and emotional self-regulation and awareness by encouraging selective intentional attention, a non-judgmental attitude, and a decentering process that might reduce negative reappraisal, emotional reactivity, and rumination (Gard et al., 2014; Tang et al., 2015; Guendelman et al., 2017). In support of the above-hypothesized benefits and underlying mechanisms, researchers investigating the influence of yoga and mindfulness-based interventions on the health and well-being of university students have shown reductions in stress, depression, and anxiety (Smith et al., 2011; Falsafi, 2016; McConville et al., 2017; Breedvelt et al., 2019; Halladay et al., 2019); increased awareness, attention, memory, executive function, neuroplasticity, and overall cognitive and emotional functioning and self-regulation (Tang et al., 2007, 2010, 2015; Zeidan et al., 2010; Gothe and McAuley, 2015; Brunner et al., 2017); and the alleviation of specific concerns related to higher education student musicians such as music performance anxiety (Chang et al., 2003; Stern et al., 2012; Khalsa et al., 2013). In addition, interventions incorporating hatha yoga have shown effectiveness among higher education students in ameliorating physical abilities such as flexibility, strength, and balance (Tran et al., 2001; Park et al., 2017), and cardiovascular (Ray et al., 2001; Tran et al., 2001; Smith et al., 2011) and pulmonary functions (Birkel and Edgren, 2000; Godoy et al., 2006). Beyond these health and well-being benefits, the ancient spiritual and philosophical foundations of both yoga and mindfulness might provide higher education students with a useful asset for coping in the face of a pandemic. An explanation of how such principles

can be applied to real-life situations to alleviate suffering can be found in the yoga model for self-regulation and resilience proposed by Sullivan et al. (2018b). The authors highlighted the importance of developing discrimination between *prakriti* (i.e., changing reality) and *purusha* (i.e., everlasting reality) by cultivating the witness attitude that brings the practitioner closer to *purusha* and the real self. Through this attitude, students might become more aware of their maladaptive behaviors and nurture their resilience by dis-identifying and creating distance from their *prakriti*-related concerns. A similar procedure equally derived from the experience and understanding of higher spiritual processes and pursuits is the mindful metacognitive mechanism of "reperceiving" (Shapiro et al., 2006). The potential relevance of the spiritual dimension amidst the COVID-19 pandemic has been recently underlined in a recent Spanish survey completed by 3480 participants, whereby the highest protective factor in predictive models for depression, anxiety, and stress-related symptoms was spiritual well-being (González-Sanguino et al., 2020).

In addition to yoga and mindfulness, the field of positive psychology and literature on emotional intelligence bring also valuable tools and practices to cope with the lockdown demands and difficulties. Positive psychology is majorly concerned with what goes right in people's lives and thus focuses on cultivating positive values such as happiness, well-being, hope, gratitude, and developing one's strengths such as courage, honesty, and resilience (Peterson and Seligman, 2004; Peterson, 2006). Positive psychology interventions encompass a series of practices based on components such as savoring, gratitude, kindness, empathy, optimism, strengths, and meaning. The cultivation of these attitudes and values might have an essential role in assisting with the various challenges elicited by the pandemic and the corresponding lockdown situation. Positive psychology interventions including components of gratitude and strengths have resulted in an increase of happiness, well-being, and decrease of depressive symptoms (Sin and Lyubomirsky, 2009). For instance, positive psychology interventions instructing participants to list grateful things per day have led to improvements in positive affect (Martínez-Martí et al., 2010), life satisfaction (Manthey et al., 2016), happiness (Mongrain and Anselmo-Matthews, 2012), and stress (Kerr et al., 2015). In addition, savoring, or the ability to be engaged in the appreciation of one's activities and experiences, has been found to increase resilience and happiness and reduce depressive symptoms (Smith and Hanni, 2019). Lastly, knowledge about emotional intelligence provides an additional tool to face the emotional and psychological consequences of the lockdown with compassion, empathy, and care in the build-up of intrapersonal and interpersonal intelligence. Emotional intelligence places a major emphasis on monitoring one's emotions and those of others to employ this output efficiently to support one's behaviors effectively (Salovey and Mayer, 1990). To that end, the employment of Goleman's (1998) five components of emotional intelligence – self-awareness, self-regulation, motivation, empathy, and social skills – might play a crucial role to offset the emotional outburst experienced by higher education students due to the lockdown. There is evidence supporting the

efficacy of emotional intelligence for the promotion of positive emotions, life satisfaction, happiness, stress reduction, and well-being (Mayer et al., 2008; Ruiz-Aranda et al., 2014).

As can be drawn from this review of literature, the four foundations of the CRAFT program prescribe a series of practices and components that have been found effective for bestowing a variety of physical, mental, emotional, and spiritual health and well-being benefits among their practitioners. Therefore, a careful selection of these practices and components, tailored to suit the specific needs of higher education students within the framework of a single program, could provide them with a more complete and valuable set of coping strategies than each of these four foundations could offer alone to concurrently address their various lockdown demands and difficulties independently. The rationale supporting this supposition is based on the premise that a potential limitation of a given foundation could be strengthened by another. For instance, the theories and methods underlying both positive psychology and the research field of emotional intelligence do not make direct references to specific physical practices for health and well-being purposes, and those of mindfulness-based interventions such as the modern Mindfulness-Based Stress Reduction program (MBSR; Kabat-Zinn, 1990) include only a few postural elements drawn from *hatha* yoga. By contrast, a myriad of physical practices have been prescribed in the various styles of *hatha* yoga that sprang from the ancient yoga treatises, thus supporting the greater versatility of yoga to potentially induce physical changes and address musculoskeletal concerns than the other three foundations of the CRAFT program. In addition, though all four CRAFT foundations could offer a distinct way for developing emotional self-regulation-related skills, mindfulness and emotional intelligence components and practices place a direct emphasis and focus to train these abilities. Further details and supporting evidence about the particular practices and components drawn from, adapted from, or inspired by each foundation as part of the CRAFT program can be consulted elsewhere (Posadas, 2019; Posadas and Bartos, under review). Along these notions, a primary objective of the CRAFT program is to raise students' consciousness of their inner responsibility to be actively engaged in their health and well-being processes, encouraging the application of the different learned techniques to real-life situations with full awareness. This is a path that places a major emphasis on the self – far away from selfishness but rather for the common benefit of developing more conscious communities – through the promotion of a self-inquiry, self-knowledge, self-responsibility, self-caring, and autonomous problem-solving attitude, whereby self-engagement stands as the driving common ground. Such a self-rooted paradigm also finds expression in the four foundations of the CRAFT program, being highly integrated into the philosophy of yoga and mindfulness-based practices. For instance, Desikachar et al. (2005) explained how yoga drives their practitioners to develop self-caring, self-responsibility, and self-inquiry health and well-being attitudes and demeanors by actively self-engaging in the different practices of yoga with a conscious disposition for finding the root of their health and well-being concerns.

The purpose of the current study was to explore the applicability and potential perceived benefits of the CRAFT program, administered during the lockdown at a higher conservatory of music, to improve student musicians' health and well-being in comparison to a control group. Based on the abovementioned evidence supporting the effectiveness of the four foundations of the CRAFT program for improving a variety of health and well-being concerns and their emphasis on nurturing self-promoting attitudes and behaviors, we postulated the following hypotheses: The first hypothesis was that there would be a higher proportion of participants in a CRAFT program group (i.e., participants enrolled in CRAFT-based elective subjects) than in a control group (i.e., participants enrolled in other elective subjects) that would be proactive in terms of implementing practices as coping strategies to improve their health and well-being during the lockdown. This may be because participants in a CRAFT program group might have developed a higher level of self-engagement for taking care of their own health independently than participants in a control group. Subsequently, we also expected that among proactive participants in a CRAFT program group, there would be a higher proportion of participants implementing CRAFT-based practices than other types of practices as coping strategies to improve their health and well-being during the lockdown. The second hypothesis was that the proportion of proactive participants perceiving benefits from their practices implemented would be higher in a CRAFT program group than in a control group. This may be because participants in the CRAFT program group may have acquired new skills and learned health practices that may have provided them with an early foundation that they can now draw on effectively during stressful times brought about by the pandemic. Subsequently, we also expected that among proactive participants in a CRAFT program group, there would be a higher proportion of participants perceiving benefits from CRAFT-based practice implementation than from other types of practices.

MATERIALS AND METHODS

Study Design, Setting, Participants, and Procedures

The present study was designed in response to a naturally occurring life event of unprecedented dimensions within the context of an ongoing longitudinal investigation, which is still in progress and will be reported elsewhere. As such, various aspects of the present study derived from the pre-existing longitudinal design and the unexpected emergence of the COVID-19 pandemic. Below, we describe this procedure in detail within its pertinent context and timeline.

Current Study Context: Longitudinal Study
Each year since the curricular application of the CRAFT program in 2017 at the Royal Conservatory of Music of Granada Victoria Eugenia, a longitudinal research project, approved and funded by the Regional Government of Andalusia, was conducted to examine the influence of the program on student musicians'

physical, cognitive, and psychological abilities, health, and well-being. In the academic year 2019/2020, the application of the program in the CRAFT-based elective subjects of Mindfulness and Emotional Intelligence started on November 6, 2019. As in all elective subjects, instruction occurred once a week for 1 h over the course of the entire teaching phase of the academic year that ended on May 13, 2020. After obtaining ethical approval from the Institutional Review Board of the University of Granada (n° 1009/CEIH/2019), the third longitudinal study was advertised to the students by the conservatory's website, fliers, and announcements given by different faculty members. From January 13–29, 2020, student musicians were recruited through brief presentations of the study objectives and requirements held at the music conservatory. It was during these presentations that prospective participants were informed that their participation was voluntary, anonymous, and not linked to the marks of any of their subjects, and that they could withdraw from the investigation at any time and with no consequences for their studies. Therein, 197 interested student musicians signed a consent form and completed most of the baseline assessments. In order to safeguard their anonymity, they were instructed to assign themselves an alphanumeric code, to be provided in all tests and surveys related to the study. In the same recruitment session, students were informed of the possibility to enroll in an extracurricular workshop related to the investigation in exchange for credits towards their studies.

Group allocation was based on student musicians' enrolment in pre-existing elective subjects. As a result, participants enrolled in the CRAFT-based elective subjects of Mindfulness and Emotional intelligence formed the CRAFT program group ($n = 82$), whereas participants enrolled in elective subjects, not including the CRAFT-based ones such as history of Spanish music, ergonomics, ethnomusicology, ensemble, foundations of direction, German, and English, served as a control group ($n = 115$). The intervention designed for the longitudinal study continued as planned until the emergence of the COVID-19 pandemic and the commencement of the national lockdown.

The Emergence of COVID-19 Gives Rise to the Current Study

The onset of the lockdown elicited by the COVID-19 pandemic occurred on March 14, 2020, halfway through the longitudinal study, a time at which the program had already been running for 16 weeks. As a result, both the program and the study were adapted to continue in an online format for the ensuing weeks. At this crucial stage, we considered that the particular implications of such an unprecedented event relative to student musicians' participation in a pre-existing health and well-being program were worthy of investigation as a separate study. This led us to formulate a new set of hypotheses, driving the design and purposes of the current study reported herein, to explore the applicability and potential perceived benefits of the CRAFT program to improve student musicians' health and well-being during the lockdown in comparison to a control group. To that end, we developed an online questionnaire specifically tailored to examine these hypotheses. Following approval of this procedure by the same University Institutional Review Board

(n° 1468/CEIH/2020), participants were contacted by email on June 1, 2020, 1 week after they concluded their final exams, and were invited to complete the aforementioned survey no later than June 15, 2020. As a further incentive, two tablets were raffled among all participants who completed their participation in the entire longitudinal investigation. The online questionnaire included a preliminary note informing participants that any of their potential responses to the questions were optional and not contingent on receiving any of the incentives that they had been offered. From the initial sample of 197 participants, a total of 97 participants, 44 participants from the CRAFT program group and 53 participants from the control group, filled in the online survey.

Setting and participants

Participants were higher education student musicians of the Royal Conservatory of Music Victoria Eugenia, a public institution located in Granada, Spain, providing an advanced 4-year higher education music curriculum equivalent to a bachelor's degree. Inclusion criteria required participants to be full-time student musicians aged 18 years or older enrolled at the Royal Conservatory of Music Victoria Eugenia during the academic year 2019/2020. Students were excluded from the study if they received any psychological, psychiatric, and/or psychopharmacological help during the lockdown. Four participants in the CRAFT program group were excluded from the study following this criterion. Thus, the final total sample for the current study consisted of 93 participants – 40 participants in the CRAFT program group and 53 participants in the control group – age range 18–39 years, of whom 55 were females.

CRAFT program protocol

Participants in the CRAFT program group received a total of 23 h of instruction in the program, which corresponded to the total curriculum time allotted for each one of the CRAFT-based elective subjects (Mindfulness and Emotional Intelligence). The first 16 classes were taught in a multi-purpose and spacious classroom well-equipped with yoga mats, blocks, and other materials to facilitate the performance of the different practices implemented. Due to the lockdown, the last 7 h were completed through the online platform *Zoom*. The entire instruction was administered by the creator of the CRAFT program at a frequency of delivery of once a week for 1 h per subject. Beyond her academic formation as a professional musician, translator, and Ph.D. in phonetics applied to singing, the founder of the program is an advanced certified yoga teacher who holds a postgraduate degree in Expert on Mindfulness in the Educational Context. Her mind–body-related background encompasses over 30 years of meditative practice from both ancient Buddhist and yogic traditions, 26 years as a yoga practitioner, and over 15 years of both independently teaching these practices and integrating them within her academic area of professional expertise as a professor of the Royal Conservatory (i.e., music and language higher education). The developer of the program (author MPP) was blind to the study hypotheses, measures, and participants' recruitment.

Though the program was applied in both elective subjects, there was a preponderance of yoga and mindfulness content

in the CRAFT-based elective subject of mindfulness, whereas a prevalence of emotional intelligence, compassion, and positive psychology theory and practice was at the core of the CRAFT-based elective subject of Emotional Intelligence. Another notable difference was that the 15-min physical protocol based on *hatha* yoga was only applied in the CRAFT-based elective subject of mindfulness. Despite these differences, both the five elements of the program and the four foundations were taught in both subjects. During the first 13 classes, there was a focus on working on the first, second, and third elements of the program (e.g., consciousness, relaxation, and attention), whereas for the remaining 10 classes, all elements of the program were taught and practiced.

The five elements of the program are worked through different practices based on its four foundations and adapted to the specific needs of student musicians. Therefore, particular emphasis is given through reflective group discussions and debates on how to specifically integrate them within their daily lives to address their academic, professional, and life demands. For instance, the first element *Consciousness* is first developed through the cultivation of observing one's body, mind, and emotions with openness, compassion, and a non-judgmental attitude. One of the main goals of *Consciousness* is that student musicians become more aware of their physical, mental, and emotional states so that they can self-regulate them appropriately to meet their particular needs. This is trained through both *hatha* yoga and mindfulness-based practices such as *antar mouna*, breath awareness, RAIN (i.e., recognize, accept, investigate, non-identification), yoga postures, meditation, and other related practices created by the developer of the program such as the FEM meditation (i.e., meditation based on the impartial observation of physical sensations, emotions, and thoughts). Hence, student musicians are taught how to implement such practices not only to increase their awareness but also to integrate them in their daily lives to self-regulate their posture, music performance anxiety, perfectionism, musculoskeletal problems, and other health and well-being concerns. This fusion of both mindfulness and yoga leads to a CRAFT mindful yoga that is also applied in the remaining elements of the program. Thus, the second element *Relaxation* was developed through various *pranayamas* (e.g., *sitali*, *sitkari*, *bhramari*, alternate nostril breathing, and full yogic breathing), visualization techniques, yoga *nidra*, *shamatha* meditation, and other *hatha* yoga-based relaxation practices including progressive-muscle relaxation and autosuggestion components. The third element *Attention* was mainly worked through different meditation techniques (e.g., mantra meditation, open monitoring meditations, breath awareness meditation, and attention-based exercises and games), and specific *pranayama* practices. The path of *raja* yoga, with a focus on its last three meditative components (*dharana*, *dhyana*, and *samadhi*), is discussed and practiced along with other mindfulness-based meditations and practices such as *shamatha* meditation from ancient Buddhist traditions and the body scan from the modern MBSR program. The development of consciousness, relaxation, and attention through these practices paves the way to the fourth element *Happiness*, fostering, in turn, a meditative state of "flow experience", or the

so-called "engagement" component from positive psychology, whereby an optimal music performance might emerge. This is also worked in the classroom through group-meditative improvisations and mindful concerts to tune student musicians into a state of full absorption, self-control, and happiness. In addition to the practices of mindfulness and yoga, which share the profound purpose of bringing everlasting happiness among its practitioners, the teaching of the fourth element *Happiness* added intrinsic components from both positive psychology and emotional intelligence. Some of these were gratefulness (e.g., listing grateful things and events), engagement (e.g., flow experiences through meditative improvisations), and emphasizing one's strengths and values from positive psychology; or the cultivation of empathy from emotional intelligence. Under the four foundations, happiness was studied from both the Hedonic and the Eudemonic perspectives, giving more emphasis on the latter. Moreover, other specific mindfulness practices such as loving-kindness meditation (e.g., *metta* meditation and *tonglen*) were used to teach self-compassion, compassion, and unconditional love as a pathway to develop happiness. Lastly, in close connection with the first and fourth elements *Consciousness* and *Happiness*, but also relying on the lead-up work to develop *Relaxation* and *Attention*, students received instruction in the fifth element *Transcendence*. Thus, the understanding of transcendence at an experiential level requires the mastery of all previous elements to be able to tune into the ultimate transcendental pursuits of self-knowledge and self-inquiry. It is a journey of finding meaning to life and true happiness rooted in the self rather than on the fleeting external reality. Through this element, students learn the ability to see things from various perspectives, dis-identifying themselves from their immediate ever-changing realities and concerns, and ultimately transcend them through a self-transforming attitude. This fifth element fosters creativity – as a crucial mechanism for transforming and generating new perspectives, possibilities, situations, and realities – as well as the four strengths of positive psychology related to transcendence: the appreciation of excellence and beauty, gratitude, hope, sense of humor, and spirituality (i.e., finding meaning to life). Other important aspects worked through transcendence are the promotion of intention setting, harmonious passion, and *karma* yoga (i.e., selfless service) as key instruments to flourish as individuals and as a society. Practices from all four foundations, with a focus on meditative practices based on both yoga and mindfulness, as well as reflective group discussions on their various philosophical underpinnings and real-life applications were used to teach this element.

A CRAFT program protocol, adapted to and implemented with higher education language students enrolled at the Faculty of Translation and Interpretation of the University of Granada, Spain, has been registered in Clinical Trials (NCT04392869). A further detailed description of the course outline for the CRAFT-based elective subjects of mindfulness and emotional intelligence during the academic year 2019–2020 including objectives, content, practices, and other program procedures per session can be accessed in the **Supplementary Material** file linked to the current study. In addition, further specifications of the foundations, elements, and practices of the program can be found

elsewhere (Posadas, 2019; Posadas and Bartos, under review). All participants in the CRAFT program group were encouraged to complete at least 2 h of home-based practice weekly. This included practicing at least three times a week the following components: the physical protocol, only in the CRAFT-based subject of mindfulness; both formal and informal meditation; and keeping a journal to document their own experiences with the practice of the program. A compulsory attendance rate of 80% was required to complete their instruction in the CRAFT-based elective subjects of mindfulness and emotional intelligence. In the sample for the present survey administered during the lockdown, all participants in the CRAFT program group had met this minimum attendance requirement and can thus be said to have successfully completed the program.

Measures
Online Questionnaire
The online questionnaire included seven questions. The first question asked participants whether they received any psychological, psychiatric, and/or psychopharmacological help. The second question asked participants whether they experienced any severe setback due to the COVID-19 pandemic and lockdown situation. The third question asked participants whether they had experienced relevant changes in their health and well-being due to the exceptional COVID-19 situation, while the fourth question invited participants to indicate those changes in case of reporting an affirmative answer to the third question. The fifth question included three separate statements asking participants how they would rate on a 10-point visual analogue scale their physical, psychological, and sleep quality during the lockdown. The sixth and seventh questions were specifically related to the current study hypotheses. The sixth question asked participants whether they had implemented any particular practice or activity learned throughout the academic year to improve their physical, mental, and emotional state during the lockdown. Lastly, the seventh question invited participants to indicate, in case of reporting an affirmative answer to the sixth question, which particular practice or practices they implemented, where they learned it, and briefly describe their own experience with it and the impact they had on their physical, mental, and emotional state.

Data Analysis
Data were analyzed using IBM SPSS v. 25.0 (Armonk, NY, United States: IBM Corp. 2017). Descriptive statistics were used to summarize all variables using means, standard deviations, counts, proportions, and frequencies. To determine differences between groups, separate two-way chi-square tests of independence and one-way ANOVAs were conducted for all categorical and continuous variables, respectively.

RESULTS

To hone the rigor of these results in terms of addressing the current study hypotheses, we conducted analyses for both the total sample and a filtered sample after excluding those participants that reported previous experience with yoga and/or meditation other than in the CRAFT program before the onset of the lockdown and/or in the CRAFT program during the academic years 2017–2019. This was to ensure any potential effects of prior familiarization were considered. The participants' demographic characteristics for both samples across the experimental and control groups are displayed side by side in **Table 1**. As can be observed from the total sample, the filtered sample was the result of excluding 31 participants who reported previous yoga and/or meditation experience, 9 participants (22%) from the CRAFT program group, and 22 participants (41%) from the control group. The evidence of a marginally significant association of previous yoga/meditation experience by group, emphasized by a higher observed frequency of controls, supported further the need of controlling for such potential influence by presenting additional analyses conducted on a filtered sample. There were no significant differences for any of the other demographic variables between groups within both samples, except for grade year, whereby the highest proportion of participants in the control group were distributed among the first- and second-grade year, as opposed to the predominance of third-grade year participants in the CRAFT program group.

The results for the health and well-being online questionnaire by groups within both samples are displayed in **Table 2**. No significant differences between groups were found in terms of severe COVID-19 setbacks, and health and well-being changes, within both samples. A large number of participants in both samples, 72 and 60% in the CRAFT program and control groups, respectively, within the total sample, and 71 and 74% in the filtered sample, reported having experienced relevant changes in their health and well-being. Among these, mental–emotional problems were the most frequently reported. Within the total sample, 52 and 51% of participants in the CRAFT program and control groups respectively suffered from these disturbances, while in the filtered sample, these proportions were slightly higher, 55 and 64%, respectively. In this domain, it appears that stress and anxiety were the most common concerns across both groups. In addition, 35 and 19% of participants in the CRAFT program and control groups, respectively, within the total sample, and 35 and 19% within the filtered sample, indicated affection from physical disturbances. Lastly, for this section of health- and well-being-related variables, separate one-way ANOVAs analyses revealed that there were no significant differences between groups across samples for quality of sleep and physical and mental–emotional health states.

Our first hypothesis was that there would be a higher proportion of participants in a CRAFT program group than in a control group that would be proactive in terms of implementing practices as coping strategies to improve their health and well-being during the lockdown. The two-way chi-square analyses revealed that there was a significant association between participants' group (experimental versus control) and their activity in terms of implementing practices to improve their health and well-being, in both the total sample, $\chi^2(1) = 13.41$, $p < 0.001$, and the filtered sample, $\chi^2(1) = 12.13$, $p < 0.001$. The significance level in this association was evident by the high proportion of proactive participants in the CRAFT

TABLE 1 | Participants' demographic characteristics.

Variables	Total sample			Filtered sample[a]		
	CRAFT program group (n = 40)	Control group (n = 53)	p	CRAFT program group (n = 31)	Control group (n = 31)	p
Age	22.55 ± 3.79	22.38 ± 4.64	0.85	22.71 3.94	22.81 ± 5.12	0.93
Years of musical practice	13.80 ± 3.30	13.26 ± 3.74	0.41	13.98 ± 3.59	12.95 ± 3.57	0.26
Gender						
Females	23 (57%)	32 (60%)	0.78	17 (55%)	17 (55%)	1
Level of education			0.49			0.28
High school	31 (77%)	46 (87%)		24 (77%)	27 (87%)	
Bachelor's degree	8 (20%)	5 (9%)		6 (19%)	2 (6%)	
Master's degree	1 (2%)	2 (4%)		1 (3%)	2 (6%)	
Grade year			**0.003**			**0.022**
First	5 (12%)	20 (38%)		4 (13%)	12 (39%)	
Second	9 (22%)	18 (34%)		7 (23%)	10 (32%)	
Third	18 (45%)	9 (17%)		15 (48%)	5 (16%)	
Fourth	8 (20%)	6 (11%)		5 (16%)	4 (13%)	
Yoga/meditation experience	9 (22%)	22 (41%)	0.05	NA	NA	
CRAFT (2017–2019)	1 (2%)	7 (13%)	0.07	NA	NA	
Other yoga/meditation	8 (20%)	15 (28%)	0.36	NA	NA	

Values are mean ± SD with respective p values computed with one-way ANOVA, or n (%) with respective p values computed with chi-square. Bold font denotes significance. [a]Filtered sample after excluding participants that reported previous exposure with yoga/meditation other than in the CRAFT program before the lockdown and in the CRAFT program during the academic years 2017–2019. NA = not applicable.

program group, 92 and 93%, in contrast to the 58 and 55% of their counterpart controls in the total and filtered samples, respectively.

As can be observed from the last section of **Table 2**, proactive participants across both groups and samples engaged in the following four types of practices – either exclusively to one or concurrently to more than one – to improve their health and well-being during the lockdown: Yoga and/or meditation practices learned in the CRAFT program, other Yoga and/or meditation practices either identified as different from the CRAF program or not linked to it, exercise of different types, and Alexander technique-based practices learned in the elective subject ergonomics. Additional separate chi-squared analyses showed that, except for exercise and Alexander technique-based practices in the filtered sample and other yoga/meditation in both samples, participants' engagement in each of the different types of practices was not independent of their group participation. Consistently across both samples, there was a higher proportion of participants applying yoga and/or meditation practices (CRAFT and other yoga/meditation) in the CRAFT program group than in the control group, while the proportion of participants employing other practices (exercise and Alexander technique-based practices together) in the control group was higher compared to the CRAFT program group.

As expected, there was a higher proportion of CRAFT-based practice implementation than other types of practices in the CRAFT program group. In the total sample, yoga and/or meditation practices from the CRAFT program were implemented by 68% of participants followed by exercise, 46%, other yoga/meditation, 35%, and Alexander technique-based practices, 5%. In the filtered sample, a similar pattern of results

was observed as yoga and/or meditation CRAFT-based practices were implemented by 72% of participants, whereas exercise and Alexander technique-based practices were implemented by 48 and 7% of participants, respectively. Therefore, these findings notably support the applicability of the CRAFT program during the lockdown. Conversely, exercise-based activities were distinctly the most utilized practices among participants in the control group, in both the total and filtered samples, respectively, 74 and 71%, though some participation in other yoga/meditation and Alexander technique-based practices was also evident.

The second hypothesis was that the proportion of proactive participants perceiving benefits from their practices implemented would be higher in a CRAFT program group than in a control group. The two-way chi-square analyses showed that there was a significant association between participants' acknowledgment of perceived benefits from their practices implemented and their group (experimental versus control), in both the total sample, $\chi^2(1) = 5.399$, $p = 0.020$, and the filtered sample, $\chi^2(1) = 6.870$, $p = 0.009$. Notably, 78 and 79% of the proactive participants in the CRAFT program group reported perceived benefits as compared to the 52 and 41% of their counterpart controls in the total and filtered samples, respectively.

As evidenced by separate chi-square analyses conducted in both samples, participants' perceived benefits from their practices implemented were not independent of their group participation, except for other yoga/meditation practices in the filtered sample, and exercise and other practices (exercise and Alexander technique-based practices) in both the total and filtered sample. The most noticeable difference was that the proportion of participants acknowledging perceived benefits from yoga and/or meditation practices was higher in the CRAFT

TABLE 2 | Health and well-being self-reported changes and behaviors across groups during the lockdown.

Perceived outcomes	Total sample			Filtered sample[a]		
	CRAFT program group (n = 40)	Control group (n = 53)	p	CRAFT program group (n = 31)	Control group (n = 31)	p
Severe COVID-19 setbacks	4 (10%)	5 (9%)	0.93	5 (16%)	2 (7%)	0.23
Health and well-being Changes	29 (72%)	32 (61%)	0.22	22 (71%)	23 (74%)	0.78
Positive changes	6 (15%)[b]	3 (6%)[b]	0.13	4 (13%)[b]	3 (10%)[b]	0.69
Mental–emotional issues	21 (52%)[b]	27 (51%)[b]	0.88	17 (55%)[b]	20 (64%)[b]	0.43
Anxiety	13 (32%)[b]	10 (19%)[b]	0.13	10 (32%)[b]	9 (29%)[b]	0.78
Stress	13 (32%)[b]	14 (26%)[b]	0.52	10 (32%)[b]	12 (39%)[b]	0.60
Fear, worry, and despondency	6 (15%)[b]	6 (11%)[b]	0.60	6 (19%)[b]	5 (16%)[b]	0.74
Physical issues	14 (35%)[b]	10 (19%)[b]	0.08	11 (35%)[b]	6 (19%)[b]	0.15
Tiredness	6 (15%)[b]	3 (6%)[b]	0.13	6 (19%)[b]	2 (6%)[b]	0.13
Sleep disturbances	4 (10%)[b]	3 (6%)[b]	0.43	3 (10%)[b]	2 (6%)[b]	0.64
10-point VAS health states (1–10)						
Physical state	6.80 ± 1.83	6.92 ± 1.97	0.76	6.97 ± 1.83	6.90 ± 2.02	0.90
Mental and emotional state	6.23 ± 1.69	5.98 ± 2.2	0.55	6.03 ± 1.68	5.87 ± 2.41	0.76
Sleep quality	5.93 ± 2.4	5.91 ± 2.50	0.97	6.06 ± 2.46	6.00 ± 2.57	0.92
Engagement in health practices	37 (92%)	31 (58%)	**<0.001**	29 (93%)	17 (55%)	**<0.001**
Yoga/meditation practices	35 (95%)[b]	6 (19%)[b]	**<0.001**	27 (93%)[b]	2 (12%)[b]	**<0.001**
CRAFT	25 (68%)[b]	0 (0%)[b]	NA	21 (72%)[b]	0 (0%)[b]	NA
Other yoga/meditation	13 (35%)[b]	6 (19%)[b]	0.15	7 (24%)[b]	2 (12%)[b]	0.31
Other practices	18 (49%)[b]	29 (93%)[b]	**<0.001**	15 (52%)[b]	15 (88%)[b]	**0.012**
Alexander technique	2 (5%)[b]	8 (26%)[b]	**0.018**	2 (7%)[b]	4 (23%)[b]	0.11
Exercise	17 (46%)[b]	23 (74%)[b]	**0.018**	14 (48%)[b]	12 (71%)[b]	0.141
Unspecified	0 (0%)[b]	1 (3%)[b]	0.27	0 (0%)[b]	0 (0%)[b]	NA
Perceived benefits from practices	29 (78%)	16 (52%)	**0.020**	23 (79%)	7 (41%)	**<0.01**
Yoga/meditation	26 (70%)[b]	1 (3%)[b]	**<0.001**	20 (69%)[b]	0 (0%)[b]	**<0.001**
CRAFT	19 (51%)[b]	0 (0%)[b]	**<0.001**	16 (55%)[b]	0 (0%)[b]	**<0.001**
Other yoga/meditation	10 (27%)[b]	1 (3%)[b]	**0.008**	5 (17%)[b]	0 (0%)[b]	0.07
Other practices	12 (32%)[b]	15 (48%)[b]	0.18	10 (34%)[b]	6 (35%)[b]	0.96
Alexander technique	0 (0%)[b]	5 (16%)[b]	**0.011**	0 (0%)[b]	3 (18%)[b]	**0.02**
Exercise	12 (32%)[b]	9 (29%)[b]	0.76	10 (34%)[b]	3 (18%)[b]	0.22
Unspecified	0 (0%)[b]	1 (3%)[b]	0.27	0 (0%)[b]	0 (0%)[b]	NA

Values are mean ± SD with respective p-values computed with one-way ANOVA, or n (%) with respective p-values computed with χ^2. Bold font denotes significance. All displayed percentages refer to the total number of participants within group except for the variables related to the practices implemented and their perceived benefits whereby they refer to the total number of proactive participants within group; [a]Filtered sample after excluding participants that reported previous exposure with yoga/Meditation other than in the CRAFT program before the lockdown and in the CRAFT program during the academic years 2017-2019. [b]Percentages from non-mutually exclusive categories. NA = Not applicable.

program group than in the control group. By contrast, the proportion of participants perceiving benefits from the Alexander technique-based practices was higher in the control group than in the CRAFT program group, though this analysis was conducted on a very limited number of responses. Interestingly, despite the fact that there was a higher proportion of proactive participants exercising in the control group than in the CRAFT program group, there was no difference in the proportion of participants perceiving benefits from it between both groups within both samples. This result raises questions as to whether participation in the CRAFT program group was influential for those participants in this group who implemented exercise practices, either in conjunction with practices learned in the program or not, in terms of how they were applied, valued, and/or perceived.

As expected, there was a higher proportion of proactive participants in the CRAFT program group perceiving benefits from their engagement in CRAFT-based practices than from other types of practices. In the total sample, 51% of the proactive participants in the CRAFT program group acknowledged perceived benefits from implementing yoga and/or meditation practices learned in the program, followed by 32% from exercise activities, and 27% from other yoga and/or meditation practices. Similarly, in the filtered sample, 55% of proactive participants perceived benefits from implementing CRAFT-based practices, 34% from exercising, and only 17% from other yoga and/or meditation practices. By contrast, among proactive participants in the control group, 29 and 16% of participants in the total sample reported perceived benefits from the application of exercise and Alexander technique-based

practices, respectively, whereas an equal distribution relative to such proportions was observed in the filtered sample (18% from exercising and 18% from the application of Alexander technique-based practices).

In the manner in which the aforementioned results are presented, i.e., through non-mutually exclusive representation, the proportion of participants who relied on implementing just one type of practice alone cannot be discerned, or how many participants opted for a particular combination of practices. To satisfy the provision of such perspective, **Figure 1** illustrates the results of this study in a mutually exclusive representation, involving overarching practice categories (**Figure 1A**) and subcategories yielded from the various combinations of the four types of practices implemented (**Figure 1B**) along with their perceived benefits. Again, a clear pattern emerged, illustrating that participants in the CRAFT program were more likely to engage in yoga/meditation practices and more likely to report perceived benefits from those practices. When excluding participants who had reported prior experience with yoga and meditation (filtered sample on right-hand side), a very similar pattern was evident.

Table 3 includes some of the quotes illustrating some of the perceived benefits underlined by participants within their respective groups from the various categories of practices they had implemented. Answers by those students in the CRAFT program who had practiced yoga/meditation referred to the fact that they had learned skills in the CRAFT program, while some participants in the control group were drawn to audiovisual material sourced from the Internet. Some other practices by the control group overlapped to some degree with meditation, although they appeared to have been conducted without the systematic structure that formalized mindfulness and meditation practices typically have.

FIGURE 1 | The relationship between participants' engagement in the various overarching and subcategories of practices during the lockdown and their perceived benefits across groups and samples [**(A)**: overarching practice categories; **(B)** practice subcategories]. In the filtered sample, those participants that reported previous experience with yoga and/or meditation other than in the CRAFT program before the onset of the lockdown and/or in the CRAFT program during the academic years 2017–2019 were excluded. Subcategories 1, 2, and 3 belong to the overarching category "Yoga/Meditation"; Subcategories 4, 5, 6, 7, and 8 belong to the overarching category "Yoga/Meditation + Other"; Subcategories 9, 10, 11, and 12 belong to the overarching category "Other."

TABLE 3 | Participants' perceived benefits from practices implemented to improve their health and well-being during the lockdown across groups and samples.

Practices implemented	Exemplar responses from proactive participants					
	Craft program group (N_{TS} = 37; N_{FS} = 29)	Beneficial effect		Control group (N_{TS} = 31; N_{FS} = 17)	Beneficial effect	
		N_{TS} (%)	N_{FS} (%)		N_{TS} (%)	N_{FS} (%)
Yoga/Meditation	"I have practiced Meditation. I have learnt it in the Emotional intelligence class and it has been an important element to bear the situation. The changes have been relevant. Management of anxiety, stress, interfamily relationships, time management. It has been an essential help in multiple aspects." "The various techniques learnt in the Mindfulness subject such as the physical Protocol, Meditations, breath control helped me live with the current situation and see it with a neutral perspective."	16 (43)	12 (41)	"Yoga learnt through video lessons on YouTube. Honestly, I have noticed certain improvement from the first practice though I have been doing it for not a long time to feel more important beneficial effects."	1 (3.2)	1 (6)
Yoga/Meditation + Other	"Sports made me liberate accumulated tensions and feel much better with myself. I meditated a lot and thanks to the subjects of Mindfulness and Emotional intelligence I am able to manage and self-regulate my emotions, I am more conscious of my thoughts, and my sate in general." "Every day I did physical activity that helps me to relax/calm down physically, mentally, and emotionally. I also practiced meditation but not as much as I would have liked. It was difficult as it requires a prior state of concentration and calmness. However, when I applied it I have noticed outstanding changes."	11 (30)	9 (31)	"Guided meditations that helped me relax during anxious moments. Sports helped me feel my body stronger." "Meditation (audio from authorized courses), cardio, push-ups, abs, squats. All of this has helped me bear the effects I have described but I also believe that in a lockdown state like this there is no one who can be healthy regardless of what they do."	3 (9.7)	0 (0)
Other	"Online training with a personal training through Instagram. It has been very positive because it was helping me to unleash my energy and to put my body in operation". "Sports five times a week and I am very proud. I have not experienced a lot of change but it makes me feel well".	2 (5)	2 (7)	"Only doing sports has helped me keep active, feel more energic and be more positive about looking at things." "I used the 'conscious rest' practice from the ergonomics subject when I was overwhelmed and could not take it anymore. Resting for 5–10 min and let myself go without thinking of anything gave me tranquility and relaxation, which I needed it."	12 (38.7)	6 (40)

N_{TS} = Number of proactive participants in the total sample; N_{FS} = Number of proactive participants in the filtered sample after excluding participants that reported previous exposure with yoga/Meditation other than in the CRAFT program before the lockdown and/or in the CRAFT program during the academic years 2017–2019.

DISCUSSION

The current study explored the applicability and perceived impact of the CRAFT program to improve higher education student musicians' physical, mental, and emotional health and well-being during the lockdown in comparison to a control group. To increase the accuracy and breadth of this exploration, data analyses were conducted on both the total sample and a filtered sample excluding those participants who had reported previous experience with any yoga and/or meditation training other than in the CRAFT program before the onset of the lockdown, and/or in the CRAFT program during the academic years 2017–2019.

Our results showed that student musicians' participation in a CRAFT program group was associated with higher engagement in terms of implementing practices to improve their health and well-being than in a control group. This significant association was met for both the total and filtered sample and indicated that participants following the CRAFT program training showed a more proactive attitude than participants in the control group in terms of applying strategies to improve their health and well-being. The most conspicuous observation to emerge from this analysis was that almost half of the participants in the control group were non-proactive, whereas all but just three participants were proactive during the lockdown in the CRAFT program group. A meaningful comprehension of these results requires further consideration of the type of practices implemented and whether these align with the CRAFT program procedures and foundations. Remarkably, the vast majority of the proactive participants in the CRAFT program group, 95%, utilized yoga and/or meditation practices as opposed to the 19% of their counterpart controls. Furthermore, we found from the filtered sample that for up to 20 participants of the CRAFT program group, their yoga and/or meditation practices were those learned in the CRAFT program, while 13 participants relied exclusively on this exposure to improve their health and well-being. Therefore, these figures clearly show not only the preponderance of yoga and/or meditation practices as coping strategies in the CRAFT program group in comparison to the control group, but also the influence that the exposure to the CRAFT program made in terms of making such a difference. One of the key foundations of the CRAFT program is yoga. As underlined by Desikachar et al. (2005), an important characteristic of yoga is that it promotes a self-caring attitude by encouraging the practitioners to be actively involved and responsible of their own health. In addition, the authors explained that yoga's approach to the health–ill conundrum is unique by attempting to find the root of the problem within and potentially addressing each individual's needs through specific practices. These two principles engrained in the yoga lifestyle, which are also fostered as part of the CRAFT instruction, might have raised student musicians' consciousness of their inner responsibility – to a greater extent than those not attending the program – for taking actions towards improving their health and well-being during the lockdown.

In addition, among proactive participants in both the total and filtered samples, participation in a CRAFT program group was associated with higher rates of perceived benefits from the practices implemented in comparison to a control group. This result was highlighted not only by the acknowledgment of a beneficial effect from most of the participants in both the total (19 out of 25) and filtered sample (16 out of 21) implementing yoga and/or meditation practices learned in the CRAFT program, but also by the absence of significant differences between groups in the proportion of participants who indicated perceived benefits from exercising. Remarkably, in the CRAFT program group, most participants exercising in both the total (12 out of 17) and filtered (10 out of 14) samples stated perceived benefits from it, while such indication was only acknowledged by some participants in the control group in the total sample (9 out of 23) and just a few in the filtered sample (3 out of 12). Thus, it could be arguably postulated that participation in a CRAFT program might not only have been valued and applied meaningfully to real-life situations, but it could also have had an effect on how these practitioners engaged in, lived, perceived, and appreciated their experience with other practices they implemented, which might also have led to a series of unexpected benefits. The aforementioned rationale finds intrinsic alignment with the four foundations of the CRAFT program and their respective investigated and hypothesized benefits. For instance, components of positive psychology such as gratitude and savoring encourage people to appreciate and value the activities they engage in, which subsequently has been linked to further benefits such as increased happiness, well-being, resilience, positive affect, and psychological well-being (Sin and Lyubomirsky, 2009; Martínez-Martí et al., 2010; Mongrain and Anselmo-Matthews, 2012; Smith and Hanni, 2019). In addition, the concept of savoring mirrors to a great extent the concept of engagement from the PERMA model of positive psychology (Seligman, 2011) and Csikszentmihalyi's (1990) construct of flow, which are related to the development of a heightened state of awareness, and higher self-control and meaningfulness of one's experiences (Csikszentmihalyi, 1990). Similarly, both yoga and mindfulness-based practices, which are highly grounded on cultivating awareness of one's inner physical, mental, and emotional states and developing a mindful and attentive attitude in one's actions and behaviors (Gard et al., 2014; Tang et al., 2015; Guendelman et al., 2017), have been associated to the promotion of flow states, gratitude, and meaningful living (Ivtzan and Papantoniou, 2014). Therefore, such abilities, if practiced and developed under proper and experienced guidance, could automatically be transferred to other activities, potentially enhancing not only their original effects but also the way these could be perceived and valued.

Moreover, the proportion of participants perceiving benefits from CRAFT-based practice implementation was higher than the proportion of participants perceiving benefits from other types of practices. Likewise, the proportion of participants engaging in CRAFT-based practices was higher than the proportion of participants engaging in other types of practices to improve their health and well-being during the lockdown. These results, taken together with those reported for the main hypotheses of the current study, were further replicated in the filtered sample after controlling for previous yoga and/or meditation experience. Thus, our findings suggest that participants acknowledged the usefulness and effectiveness of the yoga and/or meditation components of the CRAFT program out of their formal academic

instruction and, potentially, to a greater extent than other types of practices they implemented, during stressful circumstances elicited by the pandemic. Some of the main benefits outlined by participants involved in the CRAFT-based elective subjects of mindfulness and emotional intelligence were that the practices helped them relax, clear their minds, relieve from stress and anxiety, cope with the lockdown situation, feel better, self-regulate their emotions, deal with their family relationships, become more conscious, achieve greater concentration, develop a positive attitude, manage their time, and see things from another perspective. These perceived benefits are in close connection with the five elements of the CRAFT program (i.e., consciousness, relaxation, attention, happiness, and transcendence) and concur well with the investigated benefits of the four foundations they emerge from (i.e., yoga, mindfulness, positive psychology, and emotional intelligence). However, proactive participants in the control group also cited positive effects from their engagement in exercise or the Alexander technique-based practices learned in the elective subject "ergonomics", which suggested that these activities might have also played an important role in helping them cope with the lockdown demands and related health and well-being concerns.

In this study, the impact of the COVID-19 lockdown on the health and well-being of music conservatory students was associated with a prevalence of mental–emotional concerns such as stress and anxiety. This was in conformity with recent studies reporting a high incidence of such disturbances among confined higher education students (Elmer et al., 2020; Huckins et al., 2020; Kaparounaki et al., 2020; Li et al., 2020; Liu et al., 2020; Odriozola-González et al., 2020). Moreover, physical problems were also prevalent in our sample. However, the occurrence of health and well-being concerns did not differ among groups, or how participants rated their physical, mental–emotional, and quality of sleep states. Hence, these results were unexpected and raised concerns as to whether the higher engagement observed from the implementation of the CRAFT program to improve these states was efficacious in comparison to a control group. Notwithstanding, although the cross-sectional design of this lockdown-specific study did not allow us to determine whether any between-group differences happened due to the program, it should be acknowledged that the low dosage of program delivery of 50 min per week and the emerging difficulties from adapting it to a remote learning education might have compromised its actual effect and application. In addition, as mentioned above, the control group also included proactive participants who reported perceived benefits from practicing exercise and Alexander technique-based activities to improve their health and well-being and their potential influence cannot be underestimated.

Limitations, Strengths, and Further Research

Despite partially meeting our initial hypotheses, these findings should be taken with caution due to the existence of several limitations, some of which have been already outlined at the end of the preceding paragraph. First and foremost,

the results of the current study are interpreted from the analyses of self-reported responses collected at just one point in time. Therefore, they remained at a perceptual level and no causation could be established from their cross-sectional examination. This, in turn, outlines a further limitation for the absence of any objective measure to substantiate these findings. Another limitation was that participants' allocation to groups was based on their own enrolment choices and preferences. This is often stressed as a source of bias as it contemplates the possibility that participants are already familiar with or naturally gifted for the abilities imparted in the programs they enrolled in. Although we acknowledged such possibility and attempted to partially control for it by including a filtered sample, we also underlined that self-selection is what normally happens in the community, having thus a value on its own for it represents reality as it is. Therefore, further studies should also consider this type of naturalistic research, along with traditional randomized control trials, to examine the effectiveness of wellness programs for the health and well-being of our communities, and specifically with higher education students and student musicians. Furthermore, given the holistic approach of the CRAFT program, the use of expanded qualitative methods such as semi-structured interviews could have added further insights into the lived experience and perceived benefits of participants following a health and well-being program during the lockdown. Along these lines, one of the unique aspects underlying the creation of the CRAFT program, from both a programmatic and a research perspective, lies on the basis that combining a careful selection, adaptation, and/or creation of practices and components derived from or inspired by its four foundations – yoga, mindfulness, positive psychology, and emotional intelligence – within a single program could be more complete and effective than a program based on one of them alone. To the best of our knowledge, CRAFT is the first program to synthesize the theories, practices, and philosophical underpinnings of these four disciplines. In this study, we showed how higher education student musicians' experience with the program was linked to a meaningful real-life application to improve their health and well-being during highly demanding and stressful circumstances (lockdown), even to a greater extent than those not attending the program, in terms of their proactivity and their perceived benefits associated with it. Though these results are promising and provide converging evidence for the social validity of the program, further research is needed to examine the effects of the CRAFT program in comparison with other programs, based on just one of its foundations, within longitudinal pre-post mixed methods designs on various health and well-being domains. Although there were various limitations, this study was strengthened by the addition of a filtered sample that allowed us to control for the potential influence of previous yoga and/or meditation experience; blinding the instructor/developer of the program to the study hypotheses, measures, and participants' recruitment; the inclusion of incentives; and a detailed description of the program components, practices, and procedures, the specification of

which has been repeatedly claimed as a need to be addressed in greater detail when conducting and reporting yoga-based research studies (Sherman, 2012; Elwy et al., 2014; Groessl et al., 2015). We also remind the reader that the purpose of this quasi-experimental study was not to test the efficacy of the CRAFT program but to utilize the opportunity brought about by the COVID-19 pandemic to explore to what extent participants independently perceive the skills taught by the program as beneficial to their health and thus apply them to improve their well-being during the lockdown, and this goal was achieved.

Relevance to Higher Education and Student Musicians

The results of the current study have important implications, at both educational and health prevention levels, for higher education students of any discipline and specifically for those involved in music studies. Since the COVID-19 pandemic is nowhere near over, and there may be similar pandemics in the future, we urge higher education providers to make the necessary efforts for the promotion of health and well-being programs of this kind, to be implemented within students' curriculum, to help them cope with the ensuing health and well-being demands. In light of our findings, we encourage that these programs have an emphasis on raising higher education students' consciousness of the importance of being actively involved in their own health and well-being processes. Particularly, the CRAFT program, as a multifaceted health and well-being program – integrating the theory, practice, and investigated effects of ancient mind–body therapies and modern psychological approaches – offers a variety of practices that seem to be meaningfully applied and transferred to real-life situations with potential benefits. Although much research is still needed, such techniques seem promising to be used by higher education students of any discipline for empowering themselves towards their own life and health and well-being processes, and, as a consequence, as coping or even therapeutic strategies for alleviating various health-related concerns and emotional letdowns; for replacing maladaptive unhealthy behaviors; for preventative care, with the aim of reducing the odds of developing further or more complicated illnesses at later stages of their lives; and for an overall betterment of their daily life and academic needs and performances. Moreover, the high heterogeneity and versatility of the CRAFT program practices and components, targeting various dimensions of health and well-being (e.g., physical, emotional, cognitive, psychological, and spiritual), make it largely accessible to accommodate and embrace diversity among individuals, and hence, potentially suiting the personal needs and/or preferences of higher education students. Specifically, we also endorse the continued application and investigation of the effectiveness of the CRAFT program with higher education student musicians, a population often affected by high levels of perfectionism, musculoskeletal injuries, and music-performance anxiety, and for whom, a harmonious interplay between body, mind, and emotions – through the work of the four foundations and five elements of the program – could be conducive to both maximizing their music performances and improving such aforementioned music-specific concerns (Posadas, 2019).

CONCLUSION

The present study showed how higher education student musicians applied at their own will yoga and/or meditation-based learned skills from the CRAFT program as coping strategies in response to the lockdown demands elicited by the COVID-19 pandemic. Despite not being able to determine health and well-being differences attributable to exposure to the program, our findings indicate that curricular participation in a CRAFT program at a music conservatory was associated with greater health and well-being engagement and perceived benefits than controls during the COVID-19 lockdown. This evidence made an even more compelling case for taking preventive measures and implementing more wellness programs including yoga and/or mindfulness components to help higher education students cope with their physical, mental, and emotional health and well-being needs. Therefore, we endorse the continued application of the CRAFT program with higher dosages and frequency of delivery within longitudinal studies conducted on higher education students in the midst of a global pandemic of unprecedented impact. Due to the holistic nature and heterogeneity of the program, further research investigating its influence on the health and well-being of higher education students should incorporate qualitative methods and objective measures within the framework of a robust pre-post mixed methods design with various arms.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because: It was informed in the participants' consent form that all data collected for this study would be used anonymously for their analysis and further publication in a collective manner, but never individually. The participants recruited in this study represent a small sample from just one institution (Royal Conservatory of Music Victoria Eugenia, Granada, Spain) and from specific reduced courses. Therefore, even considering that participants used an alphanumeric code to safeguard their anonymity, in some instances, they could be potentially identifiable. Nevertheless, any queries about the availability of the datasets to be used for research purposes can be directed to: MF, mjfunes@ugr.es or LB, javier.bartos@autuni.ac.nz.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Institutional Review Board of the University of Granada. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

LB and CK conceived the quasi-experimental study. MF, MP, and MO secured funding for the larger longitudinal study. MP conducted the program. LB, MF, and MO collected the data. LB, CK, and MF conducted most of the statistical analyses. LB wrote the main draft. All authors contributed to the writing.

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SUPPLEMENTARY MATERIAL

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Changes and Adaptations: How University Students Self-Regulate Their Online Learning During the COVID-19 Pandemic

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During the COVID-19 (coronavirus disease 2019) pandemic, universities had to shift from face-to-face to emergency remote education. Students were forced to study online, with limited access to facilities and less contact with peers and teachers, while at the same time being exposed to more autonomy. This study examined how students adapted to emergency remote learning, specifically focusing on students' resource-management strategies using an individual differences approach. One thousand eight hundred university students completed a questionnaire on their resource-management strategies and indicators of (un)successful adaptation to emergency remote learning. On average, students reported being less able to regulate their attention, effort, and time and less motivated compared to the situation before the crisis started; they also reported investing more time and effort in their self-study. Using a *k*-means cluster analysis, we identified four adaptation profiles and labeled them according to the reported changes in their resource-management strategies: the overwhelmed, the surrenderers, the maintainers, and the adapters. Both the overwhelmed and surrenderers appeared to be less able to regulate their effort, attention, and time and reported to be less motivated to study than before the crisis. In contrast, the adapters appreciated the increased level of autonomy and were better able to self-regulate their learning. The resource-management strategies of the maintainers remained relatively stable. Students' responses to open-answer questions on their educational experience, coded using a thematic analysis, were consistent with the quantitative profiles. Implications about how to support students in adapting to online learning are discussed.

Keywords: COVID-19, self-regulated learning, resource-management strategies, emergency remote learning, cluster analysis, higher education

INTRODUCTION

In spring 2020, universities across the globe had to shift their face-to-face education to online because of the coronavirus disease 2019 (COVID-19) outbreak. From one day to the next, university students were forced to study online, either in isolation, in student housing, or in family settings—exposing them to many distractions. Furthermore, anxiety and uncertainty about the unprecedented situation may have caused additional stress (Son et al., 2020). Altogether, this sudden change to online education, termed *emergency remote education*, and subsequently *emergency remote learning* (Hodges et al., 2020), posed many challenges to students. At the same time, the shift to emergency remote education gave students more autonomy, and it increased the need for taking control of their own learning process (Dillon and Greene, 2003; Garrison, 2003). As emergency remote education is different from regular online education, it is important to understand whether and how students adapted to emergency remote learning. The aim of the present study was to gain insight into university students' adaptation to emergency remote learning, specifically focusing on aspects of their self-regulated learning. Moreover, we wanted to know if students differed in their adaptation approach in order to gain insights in how to provide individual support.

Self-Regulated Learning During Emergency Remote Learning

In both on-site and online higher education environments, university students already have a considerable amount of autonomy. They need to plan, monitor, and control their own learning process during self-study and thus engage in self-regulated learning (Nelson and Narrens, 1990; Zimmerman, 2002). Three main categories of learning strategies can be differentiated in self-regulated learning: cognitive, metacognitive, and resource-management strategies (Duncan and McKeachie, 2005; Panadero, 2017). Cognitive and metacognitive strategies are used to process information and monitor and control one's understanding, whereas resource-management strategies are used to create optimal learning conditions. Resource-management strategies refer to managing external resources, as in seeking for help or organizing one's workplace, as well as to managing and regulating internal resources, such as effort regulation, time management, attentional regulation, and motivation (Dresel et al., 2015).

Given the sudden shift to emergency remote education at the start of the COVID-19 pandemic, combined with external stress factors, such as uncertainty about the situation, distraction at home and reduced social interaction (Son et al., 2020), as well as higher levels of autonomy, resource-management strategies may have played an important role in adapting successfully to emergency remote education. Students probably already adopted effective cognitive and metacognitive strategies because of their experience of independence during higher education, but they had to quickly adapt these strategies to apply them in the new situation (Wood et al., 2005). Effective resource-management strategies have been shown to have a positive link

to cognitive, emotional, and motivational aspects of learning. In relation to cognitive factors, resource-management strategies, specifically effort regulation, time management, and attentional regulation (concentration and dealing with distraction), were positively associated with academic performance in both face-to-face (Richardson et al., 2012) and online learning environments (Broadbent and Poon, 2015; Broadbent, 2017). With regard to emotional factors, facets of resource-management strategies, such as the organization of academic study time and motivation to invest effort in studying, are negatively affected by negative emotions (Mega et al., 2014). Furthermore, resource-management strategies, such as effort regulation and time management as well as intrinsic motivation, have been found to be positively associated with academic adjustment (van Rooij et al., 2018), which might be an indicator of their importance in adapting to emergency remote learning.

Adapting to higher levels of autonomy and successfully applying these resource-management strategies are, however, no easy feat for many students. A recent systematic review showed that students who choose to participate in online (blended) education struggle to use these strategies adequately; they experience self-regulation, motivational control, help seeking, and their technological competencies as main challenges (Rasheed et al., 2020). During the COVID-19 pandemic, students might experience similar but also additional challenges. Other than regular online education, emergency remote learning during COVID-19 involves learning in suboptimal spaces and isolation, putting a higher load on learners' resource management. Because of not having access to their regular study environment such as the library or other university buildings, students might have trouble to find a quiet study space, which potentially influences their attentional regulation (Dabbish et al., 2011). In addition, compared to regular online education, the change to emergency remote learning during COVID-19 was not voluntary, which may have had a negative influence on students' study motivation (Hsu et al., 2019). Furthermore, given the sudden shift to online education, students may not have had access to all technical resources (e.g., stable internet connection) or support from teaching staff and peers. Given the uniqueness of the situation, it is important to build an understanding on whether and how students were able to adapt their resource-management strategies when confronted with emergency remote learning.

Unraveling Individual Differences in Adaptation to Emergency Remote Education

There is increasing evidence that self-regulatory processes, including resource-management strategies, vary across individuals (Barnard-Brak et al., 2010; Dörrenbächer and Perels, 2016). Additionally, students with better self-regulated learning skills have been shown to have higher academic performance (Kitsantas et al., 2008; Barnard-Brak et al., 2010; Broadbent and Fuller-Tyszkiewicz, 2018) and better self-regulated learning intervention outcomes (Dörrenbächer and Perels, 2016). Given the individual differences in self-regulated learning, students might respond differently in the situation of emergency remote

learning: some students might find it difficult to concentrate, whereas others might double their efforts to cope with the new environment (Usher and Schunk, 2018). This is in line with the social cognitive framework on self-regulation, which suggests self-regulated learning as an interaction between personal, behavioral, and environmental factors (Usher and Schunk, 2018). Learning is situated in specific contexts, and self-regulatory processes may differ depending on the context (Boekaerts and Niemivirta, 2000; Pintrich, 2000; Efklides, 2011). For example, Broadbent and Fuller-Tyszkiewicz (2018) examined profiles in self-regulated learning for online and blended learning students. The authors uncovered five profiles of self-regulation, with online learners being more likely to belong to more adaptive profiles. Students with the highest grades had also the highest levels of time management, effort regulation, and motivation, indicating that individual approaches to learning impact performance. Uncovering subgroups of students, e.g., those who struggle significantly and those who are able to adapt more easily, and understanding different profiles of adaptation during emergency remote learning could yield important insights in how to provide tailored support to students (Barnard-Brak et al., 2010; Broadbent and Fuller-Tyszkiewicz, 2018).

In the current study, we examined how and to what extent university students adapted their resource-management strategies during emergency remote learning because of the COVID-19 pandemic. Using a mixed-method approach, we first investigated to what extent the sudden shift from face-to-face to emergency remote education influenced students' self-regulated learning, with a specific focus on their resource-management strategies: their effort and attentional regulation, motivation, time management, and time and effort investment. Specific questionnaires are available to assess students' online self-regulated learning in the contexts of MOOCs or blended learning environments. These questionnaires are adaptations of classical self-regulated learning questionnaires for on-site education to online education (Barnard et al., 2009; Jansen et al., 2017). Because of the context specificity of self-regulated learning and unique characteristics of emergency remote learning, we decided to take changes in context into account when measuring how students adapted to emergency remote learning. We therefore modified existing online self-regulated learning questionnaires (Barnard et al., 2009; Jansen et al., 2017) in order to measure changes in students' time management, effort regulation, attentional regulation, motivation, and effort and time investment. We expected these dimensions to be most influenced by emergency remote education.

Our second goal was to examine whether students adapted differently to emergency remote learning using a person-centered approach. In contrast to variable-centered approaches that assume that relationships between self-regulatory processes observed at group level are representative for the whole sample, person-centered approaches assume potential differences between subgroups of students (Laursen and Hoff, 2006). Here, we explored whether potential differences between subgroups of students were related to their general experience with education before and after the shift to online learning, engagement, and well-being as indicators of (un)successful adaptation to the situation. Third, we investigated students' experiences as difficulties and benefits of emergency remote learning, by examining their reactions to open-answer questions on this topic. By gaining insight into the different difficulties, but also potential benefits that students experienced, we aim to further inform and generate ideas about how to support students. In summary, we address the following research questions:

(1) How did the sudden shift from face-to-face to emergency remote education influence university students' self-regulated learning, focusing on their resource-management strategies?
(2) Did students adapt differently to emergency remote learning?
(3) What are the main difficulties and benefits of emergency remote learning for students?

MATERIALS AND METHODS

Setting and Participants

In March 2020, the Dutch government announced measures to stop the spread of COVID-19, among others by forcing all universities to shift all their education from face-to-face to online. At Maastricht University, education is based on problem-based learning (PBL), applying four core learning principles: constructive, collaborative, contextual, and self-directed learning (Dolmans et al., 2005). Students work on authentic, real-world cases in small tutorial groups consisting of 10–15 students. A tutor moderates the tutorial sessions as facilitator. The academic year is usually divided into six course periods of 8 or 4 weeks, each period focusing on a specific theme. The shift to online education occurred at the end of course period 4.

In May 2020, all bachelor's and master's degree students at Maastricht University ($N = 17,182$) were invited to complete an online questionnaire about their experiences during emergency remote learning. In total, 1,817 students (mean$_{age}$ = 21.3 years, 68% females) participated, which corresponds to a response rate of 10.5%. The sample included 1,543 bachelor's degree students and 274 master's degree students from all six faculties: Faculty of Science and Engineering (25%), School of Business and Economics (23%), Faculty of Health, Medicine, and Life Sciences (20%), Faculty of Law (14%), Faculty of Arts and Social Sciences (9%), and Faculty of Psychology and Neurosciences (9%).

Measures
Demographic Survey
Respondents were asked to report their age, gender, program level (bachelor's or master's degree), faculty of study, study program, and whether they were a regular Maastricht University student or an exchange student from another university.

Resource-Management Strategies
We composed a questionnaire (17 items) that assesses how the new situation influenced students' use of resource-management

strategies, based on existing questionnaires on online self-regulated learning (Barnard et al., 2009; Jansen et al., 2017). The adapted theoretical scales included attentional regulation (four items), effort regulation (five items), motivation (three items), time management (five items), and effort and time investment (two items). We were specifically interested to what extent students were able to manage their resources and adapt to emergency remote learning. Therefore, all items prompted students to think about the current situation and to retrospectively compare it to the situation before the change on a 5-point Likert scale from −2 (much less) to +2 (much more); i.e., the value of zero means no change. An example item is "In the current situation I get *much less/less/to the same extent/more/much more* distracted during self-study than before the crisis" (attentional regulation, reversed). See **Supplementary Appendix A** for all items.

Measures of Students' Adaptation to Emergency Remote Education

To assess the extent to which the educational experience changed due to the shift to emergency remote education, we asked students to rate their overall experience with education before and during the pandemic on a scale from 1 to 10. Furthermore, we assessed how students' engagement changed, as measured with four items on connectedness with peers, teaching staff, personal interest, and understanding on a 5-point Likert scale from −2 (decreased a lot) to +2 (grown a lot). An example item is "Since the beginning of the global health crisis, my sense of being connected with my fellow students has *decreased a lot/decreased/remained the same/grown/grown a lot*." As indicator for the extent of adaptation to the situation, we further asked students to rate their mental well-being ("Compared to before the beginning of the global health crisis, how do you rate your mental well-being?") on a scale from −2 (much worse) to +2 (much better).

Benefits and Difficulties

To assess potential benefits and difficulties of emergency remote learning, we asked two open-answer questions: "What did you like most during your online learning experience?" and "What did you dislike most during your online learning experience?"

Procedure

Data collection took place in May 2020. The invitation to fill out the online questionnaire about their experiences after the shift to emergency remote education was sent in week 6 of the fifth course period to ensure that students had experienced the effects of the shift from face-to-face to emergency remote education for several weeks. At the start of the questionnaire, students provided their informed consent. Besides measures on students' resource-management strategies, demographical variables, and indicators of adaptation, the questionnaire also asked more specifically about students' experiences in tutorials, lectures, and online tool use. These data were only of interest for an internal report and not analyzed in this study. Students completed the questionnaire at home using their own digital devices. Completion of the questionnaire took approximately 15–20 min. This study was approved by the Ethical Review Board of the Faculty of Health, Medicine, and Life Science.

Data Analysis

The quantitative data were analyzed using SPSS version 24 and SPSS AMOS. We examined the validity and reliability of the resource-management strategies questionnaire through confirmatory factor analysis using maximum likelihood estimation and calculation of Cronbach α value for each subscale used. We tested a five-factor correlated model. Because of the sensitivity of the χ^2 statistic to sample size (Marsh et al., 1988), we used RMSEA (root mean square error of approximation) and SRMR (standardized root mean square residual) as overall model fit indicator, and the TLI (Tucker–Lewis Index) and CFI (comparative fit index) as comparative fit indices (Schermelleh-Engel et al., 2003). RMSEA analyzes the difference between the theoretical model and the population covariance matrix, with values between 0.05 and 0.08 indicating acceptable fit. The SRMR should be less than 0.05 to indicate good fit. The CFI compares the fit of the theoretical model to the fit of the independence model with all latent variables uncorrelated; values of >0.95 indicate acceptable fit. The TLI measures relative fit of the theoretical model compared to the independence model, with values between 0.95 and 0.97 indicating acceptable fit (Schermelleh-Engel et al., 2003).

To determine differences between students, we used an iterative partitioning method, the *k*-means cluster analysis, to classify students into groups based on their scores on attentional regulation, effort regulation, time management, motivation, and effort and time investment. Neither the group membership of the students nor the number of groups was defined beforehand. The aim of the *k*-means cluster analysis is to form homogeneous clusters by partitioning data in such a way that within-cluster variance is minimized and between-group variance is maximized. We followed the procedure outlined in Kusurkar et al. (2020). First, all clustering variables were standardized using *z*-scores. In the scale on attentional regulation, 17 cases were identified as outliers (*SD* >3) and excluded before further analyses as cluster analyses are highly sensitive to outliers. For the 1,800 participants included in the analyses, we tested 2-, 3-, 4-, 5-, and 6-cluster solutions. As an indication for model fit, we calculated the ratio between the between-clusters variance and the within-clusters variance for each solution using an analysis of variance (ANOVA) *F*-test. An acceptable cluster solution needed to explain at least 50% variance in the clustering variables scores. The optimal number of clusters was selected based on the explained variance, parsimony, and interpretability of the solution (Vansteenkiste et al., 2009; Kusurkar et al., 2020). As a validation procedure, we conducted a double-split cross-validation procedure to examine the stability of the chosen cluster solution (Vansteenkiste et al., 2009). We split the sample into two random subsamples and conducted the *k*-means cluster analysis again in these two subsamples. We computed Cohen κ with cluster membership of each subsample and the complete sample for checking the stability of the cluster solution. Subsequently, to explore the external validity of the cluster solution, we examined whether cluster profiles differed regarding

their educational experience, engagement, and well-being using multivariate ANOVA (MANOVA) and *post hoc* comparisons using Bonferroni adjustments.

The qualitative data, i.e., the answers to the open questions, were thematically coded following a template approach (King, 2004) using several iterations. First, HH, SW, and WJ thematically coded the written answers to both questions, each of them being randomly assigned to a certain proportion of the data. Beginning with an open coding scheme, they continuously discussed, modified, and advanced the coding template until agreement was reached that the coding template covered all text sections. Second, we grouped the codes to the code groups of interest (i.e., the clustering variables and indicators of adaptation), see **Supplementary Appendix B**. Third, after finalizing the cluster analysis, we split the complete qualitative data set into subsets representing the identified clusters. SW and FB coded two subsets each, using the final coding template, while being blinded for the identity of the clusters. After a first round of coding, they discussed the codes and acted as second coder for each other's subsets, respectively. See **Supplementary Appendix C** for an example. The data obtained from the thematic coding per cluster were summarized and compared to the data from the quantitative questionnaire for the same cluster. The entire research team was involved in this stage of triangulation of the cluster groups with the qualitative data. Relations and meaning of the themes were discussed in the research team, taking the analysis from the categorical to a conceptual level. ATLAS.ti qualitative software, version 8 (Scientific Software Development GmbH, Berlin, Germany), was used to analyze and manage the qualitative data.

Reflexivity

The research team included an educational psychologist working as a Ph.D. candidate (FB); a cognitive psychologist working as professor in psychology (WW); an educational psychologist working as professor in education at FHML (AdB); and a physiologist and professor in education, working as scientific director of the FHML Educational Institute at Maastricht University (MoE). HH, SW and WJ have a background in social and educational sciences and were part of the project team for an internal report.

RESULTS

Students' Resource-Management Strategies During Emergency Remote Learning

To test the theoretical factor structure of the questionnaire on resource-management strategies, we conducted a confirmatory factor analysis using SPSS AMOS (**Table 1**). Confirmatory factor analyses showed an acceptable fit to the model according to the indices RMSEA, SRMR, and CFI; the TLI is just outside the acceptable ranges. χ^2 was significant; for model acceptance, it should be non-significant. However, χ^2 is highly dependent on sample size (Kline, 2005). Therefore, we chose to focus

TABLE 1 | Model fit statistics for confirmatory factor analyses.

Fit indices	Theoretical model	Threshold for acceptable fit
χ^2	806.21 ($p = 0.000$; $df = 109$)	
RMSEA (90% confidence interval)	0.060 (0.056–0.064)	0.05 < RMSEA < 0.08
TLI	0.948	>0.95
CFI	0.958	>0.95
SRMR	0.045	<0.05

on RMSEA and the aforementioned model fit indices. The reliability of the scales provides further information regarding the model fit. All scales show acceptable to high internal consistency indicated by Cronbach α values ranging from 0.75 to 0.89. See the **Supplementary Appendix** for all items. Overall, these model fit indices indicate that the theoretical model of our adapted questionnaire has an acceptable fit. Internal consistency of the engagement scale was also acceptable with Cronbach α of 0.73.

Descriptive statistics and correlations between all variables measured are presented in **Table 2**. Students' attentional regulation, referring to their ability to concentrate and deal with distractions, decreased the most in the current situation (mean = −0.87, SD = 0.86). Furthermore, students' motivation (mean = −0.70, SD = 0.89), ability to manage their time (mean = −0.38, SD = 0.86), and ability to regulate their efforts (mean = −0.40, SD = 0.49) were perceived to decrease as well. The only positive value was related to effort and time investment (mean = 0.18, SD = 1.02), showing that students indicated that they put more time and effort in their self-study compared to the situation before the crisis.

Correlations between all subscales of resource-management strategies were positive and statistically significant ($p < 0.001$), except for the correlation between effort regulation and effort and time investment ($r = 0.039$, $p = 0.10$). The highest correlations were found between attentional regulation and time management on the one hand and motivation on the other. A second correlational analysis was conducted between all subscales of resource-management strategies and the three indicators of adaptation: engagement, well-being, and overall educational experience during the crisis. All correlations were positive and significant ($p < 0.001$). The highest correlations were found between engagement and motivation, well-being and effort regulation, and educational experience during the crisis and engagement.

Differences Between Students in Adapting to Emergency Remote Learning

In the cluster analysis, the four-cluster solution fitted the data best, based on the explained incremental variance, parsimony, and interpretability of the solution. The four-cluster solution explained 62.8% variance in the attentional regulation scores, 51.8% variance in the effort regulation scores, 65.7% in the time management scores, 56.4% in the motivation scores, and 60.1%

	Mean (SD)	1	2	3	4	5	6	7	8	9
(1) Attentional regulation	−0.87 (0.86)	–								
(2) Effort regulation	−0.40 (0.94)	0.567	–							
(3) Time management	−0.38 (0.86)	0.717	0.581	–						
(4) Motivation	−0.70 (0.89)	0.645	0.518	0.662	–					
(5) Effort/time investment	0.18 (1.02)	0.300	0.039^{ns}	0.361	0.397	–				
(6) Well-being	−0.47 (0.93)	0.462	0.540	0.458	0.411	0.099	–			
(7) Engagement	−0.75 (0.65)	0.467	0.478	0.517	0.602	0.211	0.434	–		
(8) Educational experience before the crisis	8.02 (1.04)	−0.202	−0.134	−0.156	−0.160	−0.098	−0.117	−0.083	–	
(9) Educational experience during the crisis	5.72 (1.93)	0.423	0.424	0.498	0.535	0.202	0.365	0.573	0.121	–

Scales for variables 1–7 range from −2 to 2; scales for variables 8 and 9 range from 1 to 10. All correlations are significant with p < 0.001, except when indicated with ns = non-significant.

in the effort and time investment scores. **Figure 1** shows the four different groups identified based on the clustering variables, whereas **Table 3** also presents their indicators of adaptation and demographic characteristics.

The four clusters were labeled based on the reported resource-management strategies of the students in each cluster. The first cluster ($n = 393$) showed negative values in attentional regulation, effort regulation, time management, and motivation, showing that these students reported being less able to regulate their resources during emergency remote learning than in the situation before the crisis started. At the same time, this group reported investing more time and effort in their self-study. We therefore labeled the first cluster as the *overwhelmed*. The second cluster ($n = 340$) was characterized by positive values in all clustering variables, indicating that this group managed to regulate their attention, effort, and time better, and reported being more motivated than before the crisis. At the same time, they also mentioned investing more time and effort in their study. This group was classified as the *adapters*. The third group ($n = 610$) was characterized by negative values in attentional regulation and motivation and a relatively small increase in effort and time investment. This group changed their resource-management strategies the least compared to the other groups. We labeled this group as the *maintainers*. The fourth group ($n = 457$) was characterized by negative values on all scales, showing that they were heavily and negatively impacted by the situational change. On top of that and in contrast to the first group, they also reported investing less effort and time in their self-study. This group was therefore labeled as the *surrenderers*.

As a validation procedure, we conducted the double-split cross-validation procedure as outlined in Section "Materials and Methods (Data Analysis)". This resulted in Cohen κ's of 0.968 ($p < 0.001$) between the total sample and the first subsample and 0.954 ($p < 0.001$) between the total sample and the second subsample, indicating a stable cluster solution.

To evaluate the external validity of our resulting clusters, we conducted a MANOVA with cluster group as independent variable and well-being, engagement, and educational experience scores after the change as dependent variables. Results indicated a significant overall difference between the clusters, $F(9,5385) = 99.07$, $p < 0.001$, $\eta^2 = 0.14$. Follow-up ANOVAs

showed univariate effects for well-being, $F(3,1795) = 202.7$, $p < 0.001$, $\eta^2 = 0.25$; engagement, $F(3,1795) = 247.3$, $p < 0.001$, $\eta^2 = 0.29$; and educational experience scores during the global health crisis, $F(3,1795) = 205.3$, $p < 0.001$, $\eta^2 = 0.26$. Bonferroni *post hoc* tests showed that the overwhelmed (cluster 1) and the surrenderers (cluster 4) did not differ significantly from each other regarding engagement, $p = 1.00$ [confidence interval (CI) = −0.09 to 0.10], and educational experience scores, $p = 1.00$ (CI = −0.27 to 0.33). All other cluster groups differed significantly in their mental well-being, engagement, and educational experience. The overwhelmed showed the highest decrease in well-being, and the overwhelmed and the surrenderers both showed the highest decrease in engagement and the lowest educational experience scores.

Additionally, we explored potential cluster differences regarding gender, bachelor's or master's degree level, and age. Gender distribution did not vary across the clusters, $\chi^2(3) = 10.42$, $p = 0.108$, but regarding bachelor's or master's degree level, $\chi^2(3) = 10.7$, $p = 0.013$, and age, $F(3,1797) = 4.45$, $p = 0.004$, $\eta^2 = 0.007$, we did find differences. Inspecting the distribution across the clusters, proportionally more master students than bachelor's degree students were in the maintainer profile. Bonferroni *post hoc* tests showed that students in the adapter cluster and the surrenderer cluster differed significantly in their age, with the adapters being older (mean$_{age} = 21.7$) than the surrenderers (mean$_{age} = 20.8$), $p = 0.002$ (CI = 0.24–1.61).

Difficulties and Benefits Related to Emergency Remote Learning

We further investigated differences and commonalities between the cluster profiles in the qualitative analysis of reactions to the open-answer questions on benefits and difficulties related to emergency remote learning. In the following section, we will discuss the different profiles and their approach and adaptation to the situation, focusing on their attentional and effort regulation, motivation, time management, and effort and time investment. We illustrate key aspects with representative quotations from the written answers of participants. The profiles should not be interpreted as stable and fixed traits, but rather as reflecting the different adaptations and reactions of students to emergency remote learning.
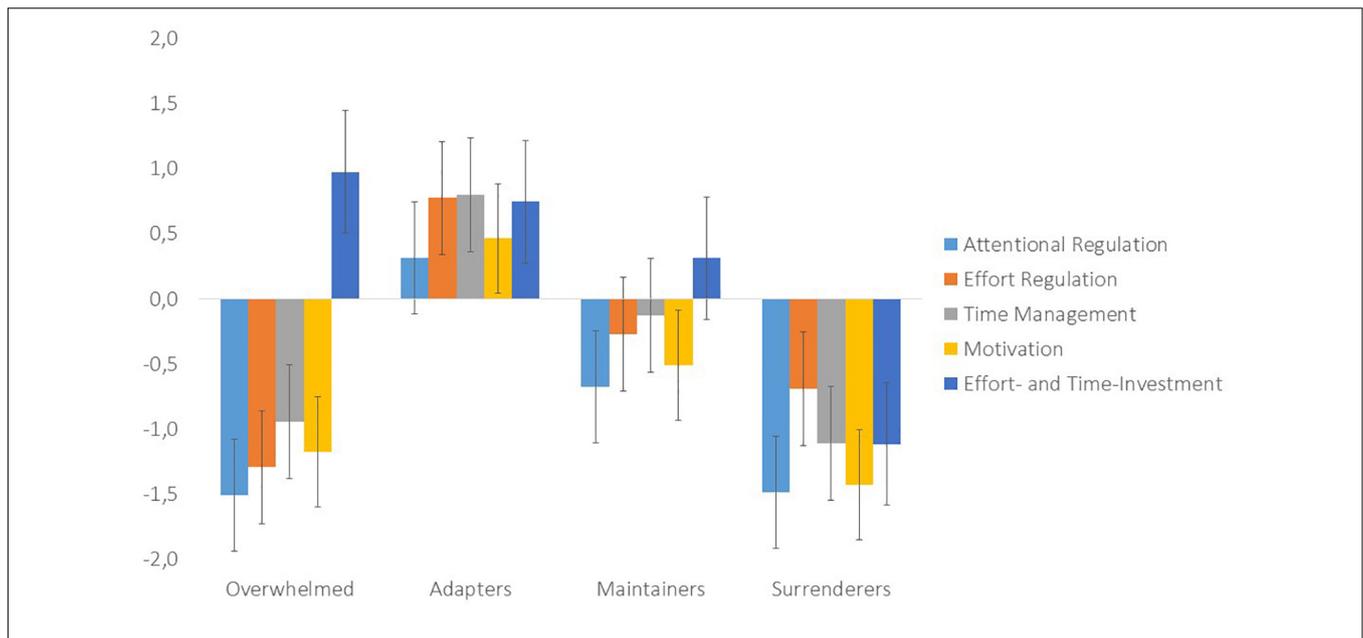
FIGURE 1 | Four-cluster solution showing the adaptation in resource-management strategies per cluster. Data are presented as means with standard error, values of zero indicating no change.

TABLE 3 | Resource-management strategies, indicators of adaptation, and characteristics for each of the four identified clusters.

	Overwhelmed (*n* = 393)		Adapters (*n* = 340)		Maintainers (*n* = 610)		Surrenderers (*n* = 457)	
Clustering variables	**Mean**	**(SD)**	**Mean**	**(SD)**	**Mean**	**(SD)**	**Mean**	**(SD)**
(1) Attentional regulation	−1.51	(0.48)	0.31	(0.61)	−0.67	(0.53)	−1.48	(0.49)
(2) Effort regulation	−1.29	(0.56)	0.77	(0.68)	−0.27	(0.65)	−0.69	(0.72)
(3) Time management	−0.94	(0.50)	0.80	(0.48)	−0.12	(0.51)	−1.11	(0.52)
(4) Motivation	−1.17	(0.65)	0.46	(0.65)	−0.51	(0.56)	−1.43	(0.53)
(5) Effort/time investment	0.97	(0.65)	0.75	(0.66)	0.31	(0.71)	−1.11	(0.54)
Indicators of adaptation								
(6) Well-being	−1.01	(0.76)	0.37	(0.90)	−0.38	(0.77)	−0.77	(0.83)
(7) Engagement	−1.06	(0.54)	−0.12	(0.59)	−0.67	(0.53)	−1.06	(0.54)
(8) Educational experience score before the change	8.09	(0.92)	7.58	(1.28)	8.09	(0.97)	8.19	(0.92)
(9) Educational experience score after the change	4.82	(1.84)	7.36	(1.45)	6.07	(1.60)	4.79	(1.73)
Characteristics								
Females, *n* (%)	275	(70.0)	230	(67.6)	437	(71.6)	288	(63.0)
Males, *n* (%)	117	(29.8)	108	(31.8)	169	(27.7)	167	(36.5%
Bachelor, *n* (%)	336	(85.5)	287	(84.4)	501	(82.1)	408	(89.3)
Master, *n* (%)	57	(14.5)	53	(15.6)	109	(17.9)	49	(10.7)
Age in years, mean (SD)	21.3	(2.4)	21.7	(4.7)	21.3	(4.3)	20.8	(2.2)

Scales for variables 1 to 7 range from −2 to 2; scales for variables 8 and 9 range from 1 to 10.

The Overwhelmed

The overwhelmed were generally negative about emergency remote learning and the overall online learning experience. Concerning attentional regulation, students mentioned difficulties to concentrate and focus due to distractions at home, being online, and not having access to the library or other study facilities. Effort regulation was perceived as harder; spending long hours in front of a screen and internet connection problems were described as straining. Motivation was described to be negatively affected because of the lack of socialization and interaction with others; some students felt isolated and depressed. The lack of external structure and organization was also mentioned to be negatively influencing their motivation. Although the overwhelmed appreciated studying at home in a comfortable space and saving travel time, maintaining a daily routine became more difficult:

> *"I dislike that we cannot do much meaningful discussions. I dislike that my internet connection is not helping. I dislike that my concentration from home is much worse than being at the [lecture]*

hall. I dislike that the libraries are closed and that I can't find a place to study well."

The increased workload and stress were salient; students felt unsure about the online examinations and extra assignments and did not feel well-supported by the university:

"All of this has to be understood in the context of not having proper schedules anymore. I guess some students have been able to adapt easily, but in my case, [. . .] it's as if there was no sense of being able to take breaks anymore. Lectures are becoming much longer than 2 h with the new materials given, and overall, I feel as if the study load has increased."

The Adapters

In general, the adapters appreciated the increased level of autonomy and self-directedness of the online setting. Students reported saving travel time, were better able to plan their days and make their own study schedule, and felt more in control of their day. Being able to watch the lectures at their own pace enabled students to check their understanding and study at times when they were more productive. This positively influenced their attentional and effort regulation, but also their time management:

"I really loved the fact that all the lectures were recorded. I think it should be like that all the time. Because of this, I was able to skip a lecture and watch it later (at a later time when I was more productive). In this period, I have learned how to manage my time very well. I really like online education overall."

Nevertheless, the adapters missed the informal social contact with their tutors and peers and experienced collaboration with other students as more difficult online. These students also perceived that online examinations caused more stress and higher workload:

"The only thing that I do not like about online education is the limitations that were imposed for online examinations, such as limited time, inability to change previous answers, higher intensiveness, more stress. [. . .] There can be a lot of unexpected technical problems that we cannot be responsible for."

Many students in the adapter profile described themselves as either too shy to participate in normal, offline settings, or having long commuting times to and from university. The online setting enabled these students to save time and to study in a safe space at home, at their own pace:

"It [online learning] took my anxiety away and made the uni experience much less stressful. It also lessened the pressure I was feeling, and I feel that my mental health has improved extraordinarily. Another great side effect was saving time that it took to go to and from university every day and has proven how much more efficient online communication is for me."

The Maintainers

In the maintainer profile, the experiences with online learning appeared to be more diverse. While appreciating the comforts of studying at home and saving time, the maintainers recognized the challenge of staying concentrated and motivated outside their regular study environment:

"That you are no longer in this direct academic environment. Normally I would go to the library before or after, and I really need that because it has always been difficult to concentrate at home best. Of course you are online with everyone you would be in a tutorial with, and while that can also have benefits because you can do it comfortably from your home, it also took away some motivation from me for sure."

Students further missed the direct contact with their tutors and peers and criticized education to be less interactive and effective than usual. Nevertheless, many maintainers showed understanding for the uniqueness of the situation and appreciated the communication of the university and guidance by tutors and course coordinators:

"In general, I am not too excited about online education, but the flexibility it brings to follow education from wherever is sometimes nice. I appreciate how hard the university is trying to communicate and develop."

The Surrenderers

Comparable to the overwhelmed, students in the surrenderer profile described their general educational experience as negative; they experienced great difficulties with attentional regulation, motivation, and time management. Some students in this profile also mentioned an increase in stress and workload, similarly to the overwhelmed. Most students mainly experienced a decrease in their motivation due to the lack of interaction with others and their general educational experience, which might explain the drop in their effort and time investment:

"The absolutely most essential thing about university is getting excited about what you learn. I easily get excited for what I learn. This period is different. Lacking friends and staff members all around me to bump into and exchange ideas with was the stimulating thing at university. Now that is completely missing, and I wake up wondering why I am studying at all. This lack of a common area and extrinsic motivation brings down the quality of what everyone contributes to PBL significantly."

At the same time, they did not invest as much time and effort in their study as the overwhelmed. Students in this profile perceived the increase in self-direction and autonomy as a burden. While they appreciated saving time and studying at home in a comfortable environment, the surrenderers had difficulties to regulate their resources during self-study:

"My motivation significantly decreased. I am also studying way less than I would usually do. Though I never missed any activities before the COVID-situation, now I no longer follow my timetable and leave the lectures for later."

Furthermore, many students in the surrenderer profile felt a mismatch between their PBL learning experience in an on-site setting as compared to the online setting. They were, moreover, critical about online learning in general:

"Online learning is not working. Quality of education provided by the university through online learning was significantly less. This was not because tutors were not prepared, but because online learning does not fit PBL and most courses."

In summary, during emergency remote learning, all students faced similar challenges, but students of the different cluster profiles coped with these challenges differently. Students of all profiles missed the personal contact with teachers and peers. The reduced collaboration and interaction negatively influenced their motivation. All students saved travel time, but the adapters appreciated the increase in autonomy and self-directedness, being able to study at their own pace. The overwhelmed and surrenderers struggled most to manage their time, attention, and efforts effectively.

DISCUSSION

The aim of this study was to examine how and to what extent university students adapted to emergency remote learning in the context of the COVID-19 pandemic. Using a mixed-methods approach, we first investigated how the sudden shift from face-to-face to emergency remote education influenced students' self-regulated learning, specifically focusing on their resource-management strategies. We administered a questionnaire on students' resource-management strategies during emergency remote learning and on indicators of (un)successful adaptation: general educational experience, engagement, and mental well-being. Our findings indicate that, in general, students experienced more difficulties in managing their time and regulating their attention and efforts and reported being less motivated than before the shift to online education. Furthermore, on average, students mentioned investing more time and effort in their self-study. In line with the difficulties in managing their resources, students experienced a decrease in their mental well-being and engagement with their studies, and their general educational experience dropped significantly.

Given the uniqueness of the situation and individual differences in self-regulated learning (Dörrenbächer and Perels, 2016), we assumed that students would differ in their abilities and approach to adapt to emergency remote learning. With the use of a person-centered approach (Kusurkar et al., 2020), we identified four adaptation profiles and labeled them according to the reported changes in their resource-management strategies: the overwhelmed, the adapters, the maintainers, and the surrenderers. These profiles allowed for a differentiated perspective on the ways students adapted to emergency remote learning. Most students were classified as maintainers (n = 610, 34%). Although their attentional regulation and motivation decreased compared to before the crisis, students' ability to regulate their efforts and to manage their time, as well as their time and effort investment, did not change significantly. Both the overwhelmed (393 students, 22%) and the surrenderers (457 students, 25%) experienced difficulties to adapt to emergency remote learning. These students reported being less motivated and less able to concentrate, manage their time, and regulate their efforts. At the same time, the overwhelmed reported investing more time and effort in their self-study, whereas the surrenderers showed a decreased investment of time and effort in self-study activities. Both groups rated the educational experience as worse than before

the crisis, while their engagement and well-being dropped, indicating that students in these profiles were unsuccessful in adapting to emergency remote learning. The fourth subgroup of students, classified as the adapters (340 students, 19%), can be considered as the group that was most adaptive to the new situation: these students reported to be more motivated and better able to regulate their attention, effort, and time than before. At the same time, this group also invested more time and effort in their self-study. Students in the adapter profile reported even a slight increase in their well-being, whereas their educational experience stayed relatively stable compared to before the crisis.

Some students struggled more on time and effort investment, whereas others struggled more regarding attention and motivation. This multidimensionality of resource-management strategies suggests a tailored support approach for students. While the surrenderers might benefit from more structure and social interaction, the overwhelmed might need more support on stress management. These results further support prior person-centered research on self-regulated learning and motivational profiles by identifying different subgroups ranging from high to low adaptability regarding resource-management strategies (e.g., Vansteenkiste et al., 2009; Broadbent and Fuller-Tyszkiewicz, 2018). However, in contrast to the online students in the study by Broadbent and Fuller-Tyszkiewicz (2018), most students in our sample related to non-adaptive profiles. This stresses the difference between students who actively chose for online learning and students who were forced to study in an emergency remote learning setting. The latter group might need more guidance and support in an online learning environment.

To gain a deeper understanding of the differences between the profiles, we analyzed the answers regarding experienced difficulties and benefits of emergency remote learning for each profile. While the aforementioned differences between the profiles were clearly represented in the open answers, similarities were noted as well. Students of all profiles appreciated the recorded online lectures and being able to study at home. However, the quality of interaction and level of active learning while studying at home differed. While the adapters mentioned being able to study in their own pace and play and pause the online lectures to monitor and control their understanding, the surrenderers rather appreciated the comfort of staying at home and not having to travel to university. This finding illustrates the difference between students in their ability to effectively apply self-regulated learning strategies, and resource-management strategies in particular. Not having access to learning facilities, such as the library, was mentioned to be a clear disadvantage and hampering students' attention and effort regulation. Students in the surrenderer profile, for example, mentioned to be highly reliant on the library to study and distractions at home hindered their resource management.

With the majority of students not being able to take advantage of the higher levels of autonomy associated with emergency remote learning and given the importance of these skills for academic achievement in online learning (Puzziferro, 2008), it is necessary to support such students in their self-regulated

learning. Future research could investigate, for example, whether prompts included in online lectures can support students in the low-adapting profiles to monitor and control their understanding and enhance their attentional regulation and motivation (Lehmann et al., 2014). The difference between students in their ability to adapt to emergency remote learning might be further explained by personality factors. Some students in the adapter profile mentioned to be shy; they felt safer participating in online education. More extraverted students, on the other hand, might suffer more from isolation and reduced collaboration in education. Furthermore, consistent with previous research, older age appeared to be related to a higher adaptive profile (Johnson, 2015). Age might be a proxy for more experience in higher education and therefore for a better ability to self-regulate. Tailored support, depending on the ability to adapt to emergency remote learning, could be beneficial (Dörrenbächer and Perels, 2016). While this study helped identifying the different groups of learners, further research into the specifically applicable interventions is needed. It would be worthwhile to examine in a longitudinal study whether these different adaptation profiles are stable. In that case, it would be of interest to measure students' resource-management strategies at the beginning of an online course to provide tailored support and mentoring during the online learning experience.

Students of all four profiles reported having missed the social contact and interaction with their teachers and peers. The reduced collaboration was described as less motivating compared to face-to-face education. Online communication and collaboration, especially in tutorials, were experienced as more straining due to long screen times and the lack of non-verbal communication. These findings resonate with the challenges of blended online learning environments, such as increased feelings of isolation and disinterest, and students feeling alienation and isolation in online learning (McInnerney and Roberts, 2004; Rasheed et al., 2020). How to facilitate collaboration in online education and address students' isolation are important questions for future research. For example, as suggested by McInnerney and Roberts (2004), social interaction in the online environment could be enhanced through increasing the use of synchronous communication and dedicating time to form a sense of community, for instance, by starting synchronous contact with low-stakes learning tasks, using visual cues to guide learners' attention and prioritize tasks and resources that require low bandwidth to reduce internet connection problems (Green et al., 2020). In order to create and maintain academic communities and relationships, it is necessary to scaffold communication and collaboration carefully and to combine both synchronous and asynchronous contact with teachers and peers (Nordmann et al., 2020).

The fact that students in the current study were used to a highly interactive and collaborative educational format (PBL) may have contributed to the aforementioned difficulties to adapt to a less collaborative format. Students that had initially chosen to study in a highly collaborative setting were now forced to study in a highly autonomous learning environment with online contact only. Students in the low-adapting profiles

(surrenderers and overwhelmed) often mentioned a general mismatch between their online and on-site experiences with PBL. Their negative attitude was also reflected in their general educational experience scores. In a transition from face-to-face to online education, it seems therefore important to guide the transition and align the expectations of students and teachers toward the online format (Kebritchi et al., 2017; Nordmann et al., 2020). Most students also experienced increased workload and invested more time in their self-study. They often mentioned examination-related stress and uncertainty about assignments and online proctoring as a reason. Managing the expectations of students regarding the online format and the way examinations are structured through more guidance and communication could alleviate stress and experienced workload.

This study has several limitations. First, the generalizability of our results might be limited given the PBL context in which the participants of this study were studying. Students were used to participate in small, discussion-based tutorial sessions. In the crisis situation, tutorial sessions continued online, with less active discussions and a lack of non-verbal communication, which may have had a larger effect on students' self-regulated learning strategies than in a more traditional curriculum. Furthermore, the response rate of 10.5% was rather low. Given that non-respondents may be students who have experienced significantly more or less difficulties due to the pandemic, this might have biased the results. However, the composition of the sample was highly diverse, with students of all faculties and including bachelor's and master's degree students of different years and may therefore be considered as relatively representative for this university.

Second, the measurement of students' adaptation to the situation was based on self-report and may have been altered by retrospective bias (Stone and Shiffman, 2002). As respondents were asked to compare the current situation to the situation before the shift to emergency remote education, no conclusions can be drawn regarding the general level of self-regulation; the findings only provide information about the level of adaptations to the change. Moreover, we adapted existing questionnaires on online self-regulated learning to capture the level of self-regulation during a change to emergency remote learning. We specifically focused on students' resource-management strategies given the increased relevance of these strategies during the crisis and did not assess students' cognitive and metacognitive strategies. Future research on how students adapt to online learning could include all aspects of self-regulated learning to generate a complete picture.

CONCLUSION

While the emergency part of emergency remote learning may not be as emergent anymore and universities might go back to full face-to-face education as soon as possible, online education and remote education are likely to remain part of future educational formats. The current study sheds light on how students adapted to online education in the context of a crisis. While many students

experienced difficulties to manage their resources and engage in self-regulated learning, different profiles of adaptation emerged: the overwhelmed, the surrenderers, the maintainers, and the adapters. These profiles may serve as framework for future research on tailored interventions to support students adapting to online and remote education. Important aspects entail the focus on facilitating online collaboration and socialization to conquer feelings of isolation, guiding attentional and effort regulation during self-study, and managing students' expectations about online learning.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are not readily available because informed consent signed by participants stated that data were only accessible to the authors of this study. Requests to access the datasets should be directed to FB, f.biwer@maastrichtuniversity.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethical Review Board of the Faculty of Health, Medicine, and Life Sciences, Maastricht University, the Netherlands (approval number: FHML-REC/2020/065). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors were responsible for the design of the study. FB performed analysis of the quantitative data, in close collaboration with WW. HH, WJ, SW, and FB performed analysis of the qualitative data, in close collaboration with the other authors. FB drafted the article, incorporating edits, and feedback from all other authors (WW, AB, ME, HH, WJ, and SW). All authors made a substantial contribution to the interpretation of the data for this work.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.642593/full#supplementary-material

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The Impact of COVID-19 Home Confinement on Mexican University Students: Emotions, Coping Strategies, and Self-Regulated Learning

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One of the main challenges in higher education is promoting students' autonomous and self-regulated learning, which involves managing their own emotions and learning processes in different contexts and circumstances. Considering that online learning during the COVID-19 pandemic may be an opportunity for university students to take greater responsibility for their learning, it is essential to explore the strategies they have developed in the face of emotional and learning challenges during the health crisis. This study aimed at analyzing the relationships between students' emotions, coping strategies, and self-regulated learning in online learning during COVID-19 home confinement. The participants were 1,290 Mexican students from different universities throughout the country, who answered an online self-report questionnaire from standardized instruments adapted to the pandemic. Data were analyzed with descriptive and inferential analyses, including a structural equation model (SEM). Findings indicate that, although anxiety, boredom, and frustration were present among participants during confinement, the primary emotions were gratitude, joy, and hope. Second, the main coping strategies used by students participating were focused on facing and reassessing the situation. Furthermore, tranquility, hope, gratitude, and joy were positively related to self-regulated learning, although, loneliness and disinterest were negatively related. Finally, it was found that an approach to coping strategies mediated the relationship between emotions and self-regulated learning. Thus, teachers should help students understand the relevance of active coping strategies and use student-centered learning models that promote autonomous and self-regulated learning, considering each learner's needs, during and after confinement.

Keywords: COVID-19, coping strategies, self-regulated learning, online learning, higher education

INTRODUCTION

The health crisis due to the new coronavirus SARS-CoV-2 has affected the health and lives of millions of people worldwide in just a few months (WHO, 2020). In light of this scenario, preventive health actions in different countries have been crucial. However, the impact on people's lives, including education, has also been critical. In Mexico, the confinement measures necessary to fight

the spread of COVID-19 have caused closing educational institutions nationwide since the end of March 2020. Therefore, in most universities, digital technology has been seen as a means to "solve" space-time limitations (Ordorika, 2020).

The abrupt change to online learning has emphasized the need for students to self-regulate their learning; to be responsible for their studies and have constant habits to persevere in their academic goals (Martínez-Sarmiento and Gaeta, 2019). The need to adopt a more active role in the learning process, and to permanently update this throughout one's life, has been emphasized for some time (Delors, 1996) and is reflected in the "Latin American new educational agenda: the 2030 objectives" (Martín and Jabonero, 2017). This condition becomes even more necessary when we know the crisis caused by COVID-19 will reconfigure all structures established until now, although we do not know to what degree.

University students must therefore develop second-order learning capabilities and activate their cognitive, motivational, and effective learning strategies to self-regulate their learning (Zimmerman, 2008), to face academic demands and responsibilities in light of their future professional activities. However, during the home confinement that has been required during the COVID-19 pandemic, not all young people have had the same living conditions, adequate access to technology, nor do they have similar behavior and skills to face these conditions. Moreover, the content of some disciplinary areas is not adaptable to virtual settings (Pinzón and Hederich, 2008). Besides, each student has a particular way of facing social isolation due to home confinement; thus, in some cases, students' emotional well-being may be significantly reduced upon not knowing how to face uncertainty, anxiety, boredom, and even the sadness that staying home implies.

This complex reality has led researchers to analyze the educational experiences of university students during the COVID-19 lockdown. However, as far as we know, there is still not much evidence regarding students' emotions and coping strategies in terms of learning and self-regulation processes in online learning.

Emotions in University Students During Home Confinement

Emotional experiences involve a wide range of physiological, functional, and social/affective aspects (Paoloni, 2014) to respond to the demands of different contexts. Life events that affect everyday experiences have a strong emotional impact (Sandín and Chorot, 2003); they may be considered positive or negative, depending on the person's evaluation of lived experience (Bisquerra, 2011). However, in situations seen as highly threatening due to their uncertain or uncontrollable nature, people tend to present a combination of several emotional reactions (Lazarus and Folkman, 1984).

According to literature, positive emotions need to be encouraged, since they expand the intellectual, physical, and social resources of individuals, increasing the reserves from which they can draw when threats or opportunities arise. Moreover, these emotions activate avoidance and approach behaviors and contribute to more creative and open thinking and behavior, which allows building resources that serve in future adverse situations, that is, coping strategies (Fredrickson, 2001), which are very important for people's well-being (Lazarus and Folkman, 1984).

According to Taylor (2019), there tend to be different reactions in all pandemics, such as fear, anxiety, stress, confusion, and anger. Likewise, those who spend time in isolation tend to show symptoms related to post-traumatic stress, for example, fear and anxiety (Brooks et al., 2020). As indicated by several researchers (Johnson et al., 2020; González-Jaimes et al., 2021), the COVID-19 lockdowns have had a significant emotional impact on young people, causing issues such as sleeping problems, high levels of stress, anxiety, fear, anguish, and uncertainty.

Sandín et al. (2020) found that the COVID-19 health crisis had affected young Spanish people aged 19–30 years, manifesting as emotions such as concern, nervousness, unease, despair, or depression, mainly derived from intolerance to uncertainty. However, home confinement has also favored positive personal experiences, such as a greater interest in people and their future. These results coincide in general with those from Johnson et al. (2020), observing the pandemic has caused different emotional states among Argentinean adults; uncertainty, fear, and distress but also feelings of responsibility, care, and value for others.

Regarding academic life, during the COVID-19 pandemic young people have experienced uncertainty, stress, and concern for their studies since they had to carry them online, which has affected their emotional well-being (Orellana and Orellana, 2020) and academic performance (Lozano-Díaz et al., 2020). Cao et al. (2020) conducted research with 7,143 Chinese university students and concluded that 21.3% showed mild symptoms of anxiety. Moreover, living with parents in urban zones and having economic stability contributed to mitigating anxiety in young people, while the delay in academic activities contributed to an increase in anxiety during the lockdown.

Stress Coping Strategies

From the conception of stress as a process, people faced with the same stressful situation use different strategies that may result in them being adaptive or non-adaptive according to how they interpret the situation. These include being influenced by personal traits, perceptions of themselves, previous experiences, and depend on the type of stressor (Lazarus and Folkman, 1986). Thus, coping refers to the behavioral and cognitive effort used by a person to face situations that are considered stressful (Lazarus and Folkman, 1984; Sandín and Chorot, 2003), with there being a strong bond between coping strategies and the specific situation (García-Arroyo et al., 2019).

Studies and exploration of this subject traditionally differentiate between the cognitive coping efforts undertaken. From this perspective, some strategies are thought to be focused on the problem (person-situation relationship) and others focused on the emotion or emotional alterations derived from the stressful situation (Lazarus and Folkman, 1984, 1986; Amin et al., 2019). Strategies focused on the problem may be divided into active coping, which seeks to modify the situation or lessen its effects, and delayed coping, which involves looking for the

appropriate opportunity to act (Lazarus and Folkman, 1986). On the other hand, emotional strategies may take a different course and some of them serve only momentarily since, if maintained for an extended period, they may prevent adequate adaptation or the realization of active efforts, for example, when anger is released openly or when there is a denial of the situation. Emotion-focused strategies can also be differentiated into active and passive strategies.

More recent research has made a distinction between cognitive and behavioral coping strategies (Billings and Moos, 1981). The former are aimed at mediating between the stressors and the consequences experienced, while the latter involves specific actions to manage the situation or the emotional response. From this perspective, the approach (active) or avoidance (passive) aspects of the problematic situation have also been considered (Billings and Moos, 1981). Active cognitive coping would focus on evaluating the situation and previous strategies used, while active behavioral coping would focus on dealing directly with the stressful situation and its effects. In turn, avoidance of cognitive coping would imply putting the problem aside. On the other hand, emotion-focused coping, regardless of focusing on cognitive or behavioral strategies, would be aimed at re-establishing emotional balance in some way.

It should be noted that this perspective is compatible with the former classification (problem/emotion) (Lazarus and Folkman, 1984) and is reflected in specific measurement instruments that consider these two dimensions (Moos, 1993): approach coping and avoidance coping; the cognitive type strategies (such as positive reevaluation or problem solving), or behavioral type strategies (such as seeking social support) are considered. It is important to mention that these dimensions are not mutually exclusive. Moreover, coping strategies are not good or bad in themselves; their effectiveness depends on the uncertainty or intensity of the stressful situation, among other factors (Lazarus and Folkman, 1986). However, some strategies, such as problem-centered strategies, tend to be most desirable (Folkman and Lazarus, 1980), while avoidance strategies are the least desirable (Lazarus, 2006). As Vizoso (2019) mentions, problem centered coping strategies have shown a positive relationship with resilience; hence, when faced with the current pandemic crisis, students must hold on and actively flourish.

Coping strategies have to be considered within a specific context, depending on the situation to which the person is exposed (Lazarus, 2006). The COVID-19 pandemic presents itself accompanied by stressors such as the illness itself, lockdown, possible economic difficulties, and different academic or labor scenarios. In light of this complicated situation, it is relevant to analyze university students' coping strategies for their emotional stability and academic performance.

Self-regulation of Learning in Online Environments

Self-regulated learning is one of the most efficient types of learning in varied educational contexts and for different levels. It is an active process through which students establish their learning objectives and try to monitor and manage their feelings and behavior through strategies and actions that are cyclically planned and adapted for the achievement of their learning objectives (Zimmerman, 2008). Therefore, it constitutes an essential factor for involvement and academic success in on-site (Torrano et al., 2017) and online environments (Cerezo et al., 2015; Berridi and Martínez, 2017).

The online learning environments, as indicated in the systematic review of Wong et al. (2019), imply a highly autonomous component and one of self-management of the students to make their own decisions about what materials to review, when or how much to study, and what strategies to modify for the achievement of their academic goals. Likewise, more significant effort is necessary to maintain attention and focus during online activities (Alghamdi et al., 2020). Therefore, self-regulation of learning is considered a fundamental process that allows students to adapt to contexts, in this case to online learning, allowing them to develop planning, prevision, and monitoring activities (Barnard-Brak et al., 2010; Cerezo et al., 2015), to persevere when faced with difficulties in the achievement of their academic goals.

Self-regulated learning involves metacognitive processes, learning skills, and the management of emotional reactions. It thus constitutes an essential process for psychological functioning (Schmeichel and Baumeister, 2004; Zimmerman, 2008). It is the complex and dynamic interaction between the affective-motivational and the cognitive aspects that influence the effort and performance of the academic task (Zimmerman, 2008; Hendrie and Bastacini, 2020). This research corresponds to the achievement of learning in online environments and in lockdown conditions, which involves high-stress levels of coping.

According to Boekaerts (2002), a stressful factor may unleash very intense emotions in some young people and moderate emotions in others; hence, having effective control mechanisms helps students to protect themselves against the emotional states that arise as a result of daunting circumstances (Koole and Jostmann, 2004). Several researchers (De la Fuente et al., 2015) have found a significant relationship between self-regulated learning and the academic stress coping strategies of university students. They found a stronger relationship with coping strategies focused on the problem. On this subject, Jackson et al. (2000) state that optimal coping skills and regulating behavior, particularly in situations of stress, should be analyzed within an interpersonal context.

Purpose of the Study

Together with the crisis caused by the COVID-19 pandemic, the formative process of attending university requires students to put into practice functional strategies that enable young people to maintain their emotional well-being and desirable performance (Lozano-Díaz et al., 2020). According to literature, the positive and negative emotions experienced during stressful situations reflect a person's momentary evaluation of their well-being (Lazarus and Folkman, 1984). Correspondingly, various researchers have documented the significant relationship between different coping strategies and emotional well-being (Vizoso, 2019), and between the former and academic performance (Gargantiel, 2018). Moreover, the relationship

between coping strategies and self-regulated learning in a stressful academic context has been found (De la Fuente et al., 2015), highlighting the relevance of analyzing the antecedents and consequences of coping strategies. Thus, in line with previous research, this study aimed to analyze the relationships between students' emotions, coping strategies, and self-regulated learning in an online learning environment during COVID-19 home confinement. It specifically sought to:

- Identify the students' living conditions during home confinement
- Acknowledge the emotions experienced by students
- Identify students' coping strategies
- Examine the relationships between students' emotions, coping strategies, and self-regulated learning
- Examine the possible mediating role of coping strategies between emotions and self-regulated learning.

MATERIALS AND METHODS

Participants

Participants were 1,290 undergraduate (84.2%) and graduate (15.8%) students from different Mexican universities, with an average age of 24.22 years ($SD = 7.98$). From the total sample, 906 were females (70.2%). While 828 (64.2%) students were enrolled in private institutions, 462 (35.8%) were enrolled in public institutions. Regarding the discipline area, 24.3% were studying Social Sciences, Administration and Law programs; 20.2% in Education; 18.6% in Health Sciences; 8.1% in Natural and Exact Sciences; 6.4% in Engineering and Manufacture; 3.7% in Arts and Humanities; 1.5% in Agronomy and Veterinary Sciences; and the rest of participants (17.2%) were studying in other programs.

Variables and Instruments

A self-report questionnaire was designed to measure students' emotions, coping strategies, and self-regulated learning. Additionally, *ad-hoc* questions on the students' background variables and living conditions during the COVID-19 lockdown were included.

Regarding emotions, the students selected from a list of 15 emotions-compassion, tranquility, loneliness, anger, frustration, hope, boredom, fear, gratitude, confusion, sadness, anxiety/concern, lack of interest, joy, despair- (Pekrun et al., 2005; Bisquerra, 2009) in what extent they had experienced any of them during the lockdown. Answers were rated on a 5-point Likert scale (1 = never to 5 = always).

Emotional coping strategies were assessed through two instruments, the first was the Mexican version (González and Landero, 2007) of *Stress Coping Questionnaire* (Sandín and Chorot, 2003). This scale is divided amongst seven dimensions: (a) Focalization on Problem-Solving (FPS; e.g., *I have dealt with the problem by proposing several concrete solutions*; $\alpha = 0.71$); (b) Negative Self-focalization (NSF; e.g., *I have resigned myself to accepting things as they are*; $\alpha = 0.55$); (c) Positive Reappraisal (PRE; e.g., *In spite of everything, I have verified that things could have turned out worse*; $\alpha = 0.66$); (d) Open Emotional Expression

(OEE; e.g., *I have thanked some people*; $\alpha = 0.71$); (e) Avoidance (AVD; e.g., *I've tried to forget everything*; $\alpha = 0.50$); (f) Seeking Social Support (SSS; e.g., *I have spoken with friends or family to reassure myself when I have felt unwell*; $\alpha = 0.75$); (g) turning to Religion (RLG; e.g., *I have performed some ritual such as lighting candles and praying*; $\alpha = 0.66$). The adapted version for this study is formed by 21 items (from the 42 original items), three items per dimension, with Cronbach's alpha value (α) = 0.80. Answers were rated on a 5-point Likert scale.

The second instrument for measuring emotional coping strategies used the Argentinean version (Ongarato et al., 2009) of the *Coping Resources Inventory* (Moos, 1993). The scale is divided amongst four dimensions: (a) Cognitive Coping Approach (CCAP; four items; e.g., *I have thought about how this situation can change my life for the better*; $\alpha = 0.65$); (b) Behavioral Coping Approach (BCAP; 3 items; e.g., *I have sought help from other people or groups*; $\alpha = 0.69$); (c) Cognitive Coping Avoidance (CCAV; three items; e.g., *I've lost hope that things will go back to the way they were*; $\alpha = 0.55$); (d) Behavioral Coping Avoidance (BCAV; three items; e.g., *I started reading to entertain myself*; $\alpha = 0.50$). The adapted version for this study is formed by 13 items (from the 22 original items), with Cronbach's alpha value (α) = 0.80. Answers were rated on a 5-point Likert scale.

Self-regulated Learning was assessed using the *Self-Regulation Formative Questionnaire* (Gaumer Erickson and Noonan, 2018). The scale, compounded by 22 Likert-Type items, measures the students' perceived competence in the four essential components of self-regulation: (a) planning and articulation of the objective to achieve (five items; e.g., *I plan the projects I want to carry out*; $\alpha = 0.76$); (b) Monitoring of the progress and the interferences regarding the objective (six items; e.g., *I know when I'm behind on a project*; $\alpha = 0.77$); (c) control of the changes to make when things do not go as planned, through the implementation of specific strategies (six items; e.g., *I try all the possibilities that are necessary to be successful*; $\alpha = 0.76$); (d) reflect on the results and opportunities for improvement (five items; e.g., *I think about how well I am doing my work*; $\alpha = 0.75$). The total scale Cronbach's alpha value (α) = 0.92.

The students' contextual and academic variables were collected through multiple choice questions. They included gender, age, university type (public/private), education level (undergraduate/postgraduate), and academic discipline. Regarding students' living conditions, questions included state of the country (coded by region) and the environment (urban, semi-urban, and rural) in which students lived during the lockdown, the people with whom they shared living spaces (family, friends/acquaintances, lived alone), the housing spaces and technological resources to continue with their studies online.

Procedure

The questionnaire was distributed to the students through the Google Forms tool. In some cases, it was distributed through institutional mail and in others through different social, academic, and research group networks. Participants were fully informed about the study's objectives and gave their consent to voluntarily and anonymously answer the instrument, in accordance with the Declaration of Helsinki. This study was

Country region	*n*	%
Center	736	57.1
South-southeast	314	24.3
Northwest	170	13.2
West	57	4.4
Northeast	13	1
Total	1,290	100

approved by the University Ethics Committee (March 1, 2020). The information was collected during June and July 2020.

Data Analysis

The data were analyzed to verify that there was no missing or atypical information and to examine the normality and linearity of the measures. From an initial sample of 1,327 students, 37 were eliminated since they had many missing data or presented atypical values. The final sample contained 1,290 students. First, descriptive analyses (frequencies, central tendency, and dispersion) and non-parametric bivariate correlations (given the data non-normality) were carried out through SPSS Statistics. Second, a structural equation model was analyzed (Hair et al., 2010), using the SmartPLS 3.0 statistical program.

RESULTS

Students' Living Conditions During Home Confinement

Regarding living conditions during the COVID-19 lockdown, most participants indicated living in states of the country's central region (57.1%; *n* = 736). **Table 1** presents the distribution of the students by country region.

The majority of the students' housing (69.0%; *n* = 890) was located in an urban area, and only 9.8% lived in a rural area (*n* = 127). The majority of the students reported living with family members (95.5%; *n* = 1,232) and only 2.6% (*n* = 33) reported living alone. The majority of the students indicated having a personal space for studying (78.3%; *n* = 1,010) and light and natural ventilation (66.0%; *n* = 852). A high percentage of students (92.9%; *n* = 1,119) had Internet and a computer or other electronic devices to continue with their studies online (92.9%; *n* = 1,119).

Students' Emotions

The emotions reported with greater frequency by participants were gratitude ($M = 3.72$; $SD = 1.08$), joy ($M = 3.50$; $SD = 0.95$), and hope ($M = 3.39$; $SD = 1.08$), followed by other emotions such as anxiety ($M = 3.33$; $SD = 1.17$), boredom ($M = 3.24$; $SD = 1.21$), and frustration ($M = 3.21$; $SD = 1.05$). The emotions least reported were fear ($M = 2.71$; $SD = 1.19$), loneliness ($M = 2.63$; $SD = 1.18$), and lack of interest ($M = 2.51$; $SD = 1.19$).

Coping Strategies Used by Students

Most participants (74%) mentioned using Positive Reappraisal of the Situation (PRE) and 67% indicated having put Cognitive Coping Approach (CCAP) strategies into practice. Also, 67% of participants carried out Avoidance (AVD) strategies, followed by 64% that mentioned having used Focalized on Problem-Solving (FPS) strategies, and 63% that used Behavioral Coping Avoidance (BCAV) Strategies.

Relationships Between Emotions, Coping Strategies, and Self-Regulated Learning

Upon considering the coping strategies based on approach or avoidance (see **Table 2**), it was found that Cognitive Coping Approach (CCAP) strategies correlate positively with emotions such as compassion, hope, gratitude, and joy. However, they also correlate positively with fear and confusion. Cognitive Coping Avoidance (CCAV) strategies correlate positively with all negative emotions (loneliness, anger, frustration, boredom, fear, confusion, sadness, anxiety/concern, lack of interest, and despair), and negatively with tranquility. Behavioral Coping Approach (BCAP) strategies correlate positively with emotions such as confusion, fear, and despair, and to a lesser extent, with loneliness, compassion, and frustration. Behavior Coping Avoidance (BCAV) and Avoidance (AVD) strategies correlate with positive and negative emotions.

Cognitive Coping Approach (CCAP) strategies, Cognitive Coping Avoidance (CCAV) strategies, and Behavior Coping Avoidance (BCAV) strategies correlate positively with all the Self-regulated Learning dimensions, the first and third and the second negatively. Behavioral Coping Approach (BCAP) strategies only correlate significantly with reflection, with very little strength.

A positive correlation was found between Focalization in Problem-Solving (FPS) and Positive Reappraisal (PRE) with all the positive emotions (compassion, tranquility, hope, gratitude, and joy). On the other hand, a positive correlation was found between Negative Self-Focalization (NSF) and Open Emotional Expression (OEE) with all the negative emotions (boredom, loneliness, anger, frustration, fear, confusion, sadness, anxiety/concern, and despair). Seeking Social Support (SSS) correlated positively with emotions associated with uncertainty, such as fear and confusion, and compassion, sadness, despair, and to a lesser extent with gratitude and joy. Finally, Turning to Religion (RLG) correlated positively with hope, joy, gratitude, compassion, and fear.

Focalization on Problem-Solving (FPS) and Positive Reappraisal (PRE) present a strong correlation with all the Self-regulated Learning dimensions. Seeking Social Support (SSS) also correlates with all the Self-regulated Learning dimensions, although the relationship's strength is meager. Negative Self-focalization (NSF) and Open Emotional Expression (OEE) show a negative correlation with the Self-regulated Learning dimensions. This inverse relationship also happens in the case of Cognitive Avoidance strategies. Finally, Turning to Religion (RLG) correlates with the Self-regulated Learning dimensions, although the relationship's strength is also low.

Bivariate correlations between emotions, coping strategies, and self-regulated learning ($n = 1,290$).

/Coping strategies	CCAP	BCAP	CCAV	BCAV	FPS	NSF	PRE	OEE	AVD	SSS	RLG
Positive emotions:											
Compassion	0.23**	0.16**	0.07*	0.12**	0.21**	0.04	0.23**	0.03	0.10**	0.21**	0.16**
Tranquility	0.07*	−0.05	−0.23**	0.05	0.25**	−0.23**	0.25**	−0.26**	0.07*	−0.06*	0.05
Hope	0.29**	0.13**	−0.07**	0.20**	0.32**	−0.13**	0.39**	−0.09**	0.14**	0.13**	0.30**
Gratitude	0.35**	0.13**	−0.03	0.15**	0.27**	−0.05	0.42**	−0.02	0.18**	0.16**	0.20**
Joy	0.20**	0.10**	−0.08**	0.14**	0.24**	−0.16**	0.33**	−0.10**	0.15**	0.16**	0.20**
Negative emotions:											
Boredom	0.00	0.08**	0.24**	0.08**	−0.19**	0.29**	−0.13**	0.29**	0.15**	0.07*	−0.07**
Loneliness	0.04	0.17**	0.34**	0.11**	−0.06*	0.38**	−0.08**	0.29**	0.12**	0.12**	−0.05
Anger	0.08**	0.12**	0.29**	0.04	−0.09**	0.33**	−0.07*	0.52**	0.10**	0.14**	0.00
Frustration	0.15**	0.14**	0.39**	0.12**	−0.07*	0.44**	−0.02	0.45**	0.12**	0.19**	−0.01
Fear	0.20**	0.22**	0.38**	0.16**	−0.02	0.39**	0.00	0.31**	0.14**	0.22**	0.14**
Confusion	0.19**	0.24**	0.41**	0.16**	0.02	0.40**	0.01	0.36**	0.15**	0.22**	0.05
Sadness	0.12**	0.19**	0.41**	0.14**	−0.09**	0.44**	−0.05	0.40**	0.10**	0.21**	0.00
Anxiety/Concern	0.18**	0.19**	0.40**	0.16**	−0.02	0.43**	0.01	0.42**	0.15**	0.20**	0.00
Disinterest	0.05	0.15**	0.28**	0.07*	−0.09**	0.33**	−0.12**	0.33**	0.09**	0.10**	−0.02
Despair	0.13**	0.21**	0.34**	0.11**	−0.09**	0.44**	−0.06*	0.45**	0.13**	0.20**	0.04
Self-regulated learning:											
Planning	0.21**	0.04	−0.13**	0.208**	0.41**	−0.18**	0.34**	−0.18**	0.13**	0.08**	0.17**
Monitoring	0.26**	0.04	−0.09**	0.18**	0.34**	−0.11**	0.37**	−0.10**	0.17**	0.08**	0.14**
Control	0.24**	0.01	−0.15**	0.18**	0.33**	−0.21**	0.37**	−0.19**	0.15**	0.07*	0.15**
Reflection	0.31**	0.06*	−0.08**	0.24**	0.35**	−0.13**	0.43**	−0.12**	0.20**	0.14**	0.20**

CCAP, Cognitive Coping Approach; BCAP, Behavioral Coping Approach; CCAV, Cognitive Coping Avoidance; BCAV, Behavior Coping Avoidance; FPS, Focalization in Problem-Solving; NSF, Negative Self-focalization; PRE, Positive Reappraisal; OEE, Open Emotional Expression; AVD, Avoidance; SSS, Seeking Social Support; RLG, Turning to Religion; **$p < 0.01$.
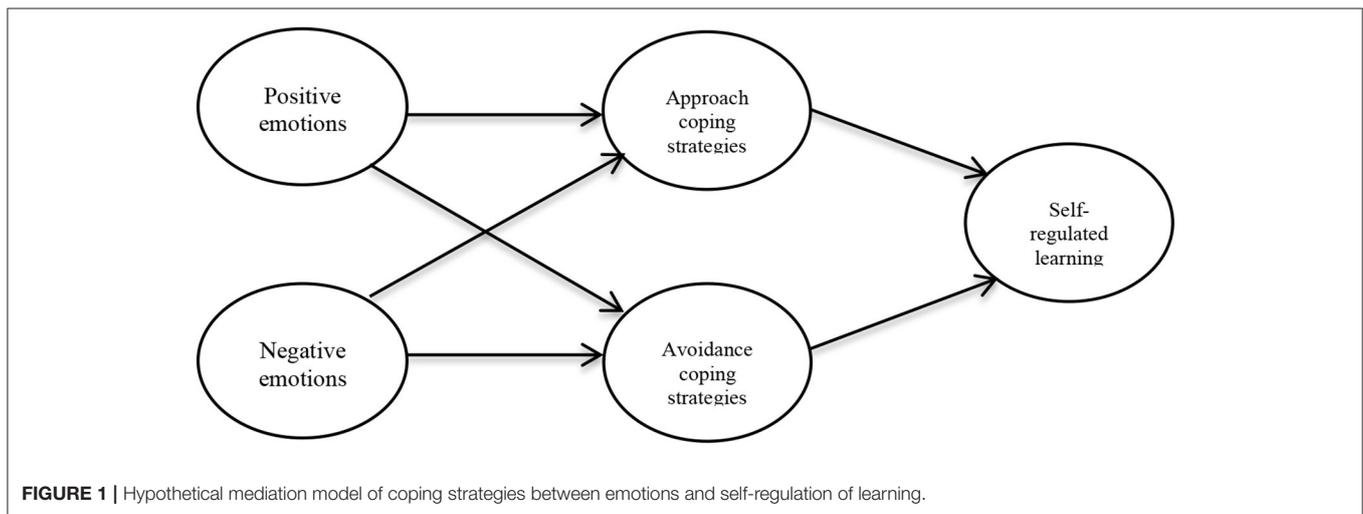
FIGURE 1 | Hypothetical mediation model of coping strategies between emotions and self-regulation of learning.

Mediation Analysis of Coping Strategies
Hypothetical Model
The correlation analysis showed that the majority of sub-scales correlated with each other, and allowed to verify the mediation assumptions in the structural equation model. A mediation analysis was carried out considering emotions as a predictor variable, self-regulated learning as a dependent variable, and coping strategies as a mediator (see **Figure 1**).

In line with the literature (Billings and Moos, 1981; Lazarus and Folkman, 1984, 1986; Moos, 1993; De la Fuente et al., 2015), the following hypotheses were set for the model:

H1: *Students' positive emotions* are positively correlated with approach coping strategies and negatively with avoidance coping strategies.

H2: *Students' negative emotions* are positively correlated with avoidance coping strategies and negatively with the approach coping strategies.

TABLE 3 | Measurement model results.

Dimension	Cronbach's alpha(α)	AVE	Compounded Reliability (CR)
Positive emotions	0.69	0.62	0.83
Negative emotions	0.89	0.64	0.92
Approach coping strategies	0.73	0.55	0.83
Avoidance coping strategies	0.70	0.63	0.83
Self-regulated learning	0.92	0.54	0.93

TABLE 4 | Heterotrait-Monotrait Ratio (HTMT) results.

	1	2	3	4	5
1. Positive emotions	–				
2. Negative emotions	0.17	–			
3. Approach coping strategies	0.72	0.14	–		
4. Avoidance coping strategies	0.18	0.83	0.17	–	
5. Self-regulated learning	0.45	0.07	0.59	0.11	–

H3: *Students' self-regulated learning* is positively correlated with approach coping strategies and negatively with avoidance coping strategies.

H4: *Students' coping strategies* mediate the relationship between emotions and self-regulated learning.

Evaluation of the Mediation Model

As shown in **Table 3**, Cronbach's alpha (α) indicates good internal consistency of the model, with values between 0.70 and 0.90 (Celina and Campo-Arias, 2005). Regarding the Average Extracted Variance (AVE) and the Compounded Reliability (CR), results show AVE values that exceed the established threshold of 0.50 (Fornell and Larcker, 1981) and CR values that exceed the established threshold of 0.70 (Nunnally, 1978).

To analyze the discriminant validity, the Heterotrait-Monotrait Ratio (HTMT) was used; values must be below the threshold of 0.90 (Henseler et al., 2015). Results show that all the constructs met the HTMT criterion (**Table 4**).

Bootstrapping technique with 500 samples was used to determine the significance of the path coefficients (β). **Table 5** presents the measurement model results. There were significant direct effects from positive emotions on approach coping strategies ($\beta = 0.52$, $p = 0.000$), and of the latter on self-regulated learning ($\beta = 0.49$, $p = 0.000$). The indirect effect of the model was also significant ($\beta = 0.25$, $p = 0.000$). These results show that when approach coping strategies are considered as a mediator variable, reduction of the direct effect of positive emotions on approach coping strategies, and the direct effect of the latter on self-regulated learning occurs. Therefore, approach coping strategies significantly partially mediate between emotions and students' self-regulated learning. Findings also indicate that the mediation model explained 25% of the variability in students' self-regulated learning.

Figure 2 summarizes the significant results. Data indicate that not all hypotheses were fully supported. Specifically, the first

TABLE 5 | Measurement model results.

Effect	β	t	SE
Direct effect			
Positive emotions → Approach coping strategies	0.52	19.87***	0.03
Positive emotions → Avoidance coping strategies	−0.05	2.26*	0.02
Negative emotions → Approach coping strategies	−0.02	0.76	0.03
Negative emotions → Avoidance coping strategies	0.65	37.40***	0.02
Approach coping strategies → Self-regulated learning	0.49	22.03***	0.02
Avoidance coping strategies → Self-regulated learning	−0.04	1.67	0.03
Indirect effect			
Positive emotions → Approach coping strategies → Self-regulated learning	0.25	14.13***	0.02
Positive emotions → Avoidance coping strategies → Self-regulated learning	0.00	1.26	0.00
Negative emotions → Approach coping strategies → Self-regulated learning	−0.01	0.76	0.01
Negative emotions → Avoidance coping strategies → Self-regulated learning	−0.03	1.66	0.02
Self-regulated learning Total effect model ($R^2 = 0.25$)			

*$p < 0.05$, ***$p < 0.001$.

hypothesis (H1) was confirmed; students' positive emotions are positively correlated with approach coping strategies ($\beta = 0.52$, $t = 19.87$) and negatively with avoidance coping strategies ($\beta = -0.05$, $t = 2.26$). The second hypothesis (H2) was partially confirmed; students' negative emotions are positively correlated with avoidance coping strategies ($\beta = 0.65$, $t = 37.40$) but not with approach coping strategies. The third hypothesis (H3) was partially confirmed; students' self-regulated learning is positively correlated with the approach coping strategies ($\beta = 0.49$, $t = 22.03$) but not with the avoidance coping strategies. Finally, the fourth hypothesis (H4) was partially confirmed; students' approach coping strategies partially mediate the relationship between positive emotions and self-regulated learning ($\beta = 0.25$, $t = 14.13$). However, there is not a significant relationship between avoidance coping strategies and self-regulated learning.

DISCUSSION

This study aimed to analyze the relationships between students' emotions, coping strategies, and self-regulated learning in online learning during COVID-19 home confinement. This section discusses the main findings of the study.

Students' Living Conditions and Emotional State During Confinement

Results showed that most participants lived in urban areas during COVID-19 home confinement and shared living quarters

FIGURE 2 | Estimated mediation model of coping strategies between emotions and self-regulation of learning. All parameters were statistically significant at $p < 0.001$, except the effect of positive emotions and avoidance coping strategies, which was significant at $p < 0.05$.
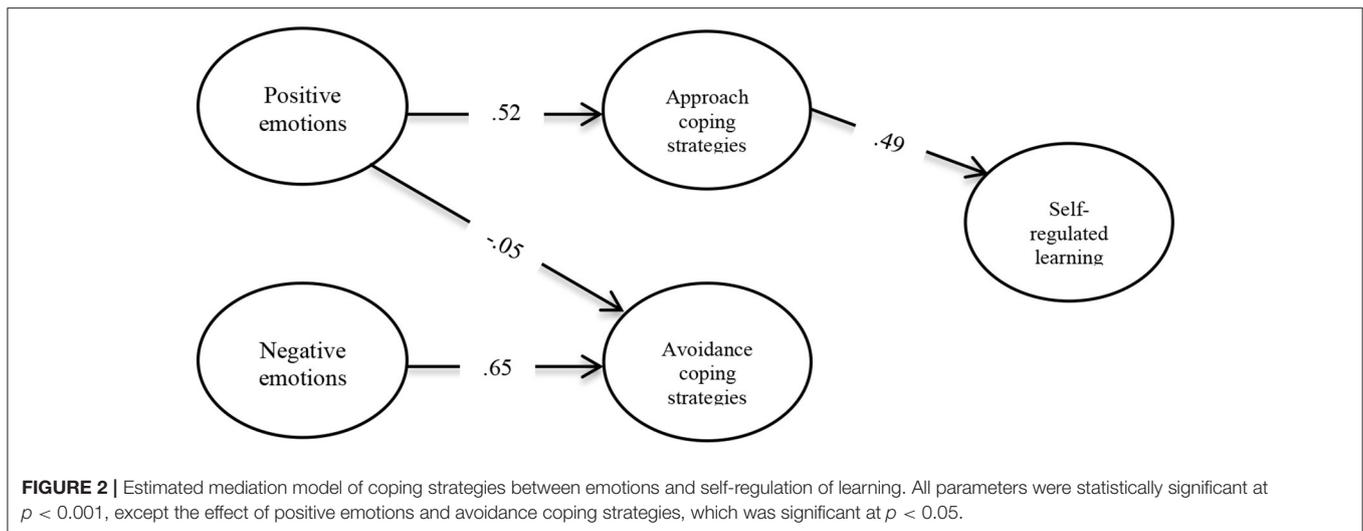
with their families. Likewise, the majority of students had their own studying space to continue their studies online; with ventilation and natural light, Internet service, computers, and other electronic devices. These findings suggest favorable conditions regarding social support, living conditions, and resources to continue studying online.

As expected in all pandemics (Taylor, 2019), anxiety and frustration were present among participants during home confinement, however, the primary emotions were gratitude, joy, and hope. Emotions such as fear, loneliness, and lack of interest were less present among participants. These results suggest that, although pandemic uncertainty and the lockdown conditions, as well as the academic demands, generated high levels of stress and anxiety in university students (Orellana and Orellana, 2020; González-Jaimes et al., 2021), this situation also favored positive personal experiences (Johnson et al., 2020; Sandin et al., 2020). Contrary to other research on this population (Johnson et al., 2020), fear had not been one of the university students' most frequent emotions.

In this sense, it is important to consider that, to a certain degree, anxiety helps one cope with situations and modify behavioral patterns to cope with uncertain situations, but in a more significant way, it may also be a risk to health and well-being (WHO, 2020). Participants' positive emotion perceptions, such as hope and joy, and relational emotions, such as gratitude, seem to be associated with the social resources and materials that most of the students had during the lockdown.

As indicated by previous research, living with parents in urban areas, with proper living conditions (Cao et al., 2020) are protective factors for students faced with anxiety caused by uncertainty and social distancing, which would seem to apply to the context of this study. According to Tipismana (2019), together with some personal factors, family support is a significant predictor of academic variables such as achievement expectations, perceived learning, and global satisfaction. Moreover, having an Internet connection (Baloran, 2020) and the commodities and devices necessary to study

online contribute to most university students' stress and anxiety mitigation.

Coping Strategies Used by University Students

Regarding the main coping strategies used by participants, results showed that 74% of students used positive reappraisal of the situation through looking for the most favorable aspects of confinement, in terms of realizing what was essential and seeing that there were good things, as well as people who worried about them. Second, they reported having put cognitive coping approach strategies into practice by saying encouraging messages, thinking they are better off than others in the same situation and that things could be worse. These findings coincide with previous research (Piergiovanni and Depaula, 2018) in which, in light of situations of stress and feeling loss of control, the majority of the students tried to face the situation by focusing on positive aspects.

Likewise, most of the students mentioned using focalization on problem-solving strategies (64%), analyzing the causes of the situation to face it, and making an action plan. These findings coincide with those of Vidal-Conti et al. (2018) and De La Rosa-Rojas et al. (2015), in which the actions carried out by university students to restore the systemic balance caused by academic stressors focused on solving the troublesome situation, by creating an action plan for concentrating on their homework.

A similar percentage of students using cognitive coping approach strategies (67%) indicated having used avoidance strategies to not think about the problem, such as watching movies or series and going for a walk or run. Another way of coping with the situation by several students (63%) was behavioral avoidance strategies such as reading, listening to music, and finding other ways to enjoy life. In general, these findings coincide with those found by Baloran (2020) upon assessing behavioral-type strategies in students, observing that participation in relaxing activities, such as sports, exercise, and music during the pandemic lockdown were beneficial.

The main coping strategies used by students were active, focused on positive reappraisal, contrasting styles more oriented to seeking social support, spirituality, and negative self-focalization. However, most students also reported behavioral avoidance strategies in the face of social distancing. Considering the frequency with which each type of strategy was used, the findings presented here are very similar to those reported by Piergiovanni and Depaula (2018), in that, after positive reappraisal, negative self-focalization, open emotional expression, avoidance, seeking social support, and, to a lesser degree, turning to religion are frequently seen in university students.

The fact that participants used more strategies focused on the problem than on emotions may reflect that, even though the pandemic as a situation is not within their control, students considered themselves capable of responding to the challenges of the situation, although, their family and living conditions may have helped. In this sense, for several decades Billings and Moos (1981) have emphasized the role of social resources in the coping strategies that are put into practice, which may complement personal resources. However, in threatening situations, people tend to present a combination of several emotional reactions (Lazarus and Folkman, 1984). In this study, religion functioned more as an emotional resource, while in the Spanish context it constituted more of a behavioral coping strategy that enabled people to focus on the problem (González and Landero, 2007).

Relationship Between Emotions, Coping Strategies, and Self-Regulated Learning

Results show that cognitive coping approach strategies, which imply thinking favorably about the situation and its consequences, maintain a positive relationship with emotions such as compassion, hope, gratitude, and joy. The former was also associated with emotions such as fear and confusion, although with less strength. These findings indicate that thinking positively about the pandemic bolsters positive emotions, but being conscious of its uncertainty may also generate negative emotions. It should be mentioned that these strategies were positively related to positive reappraisal strategies, having in common the possibility to make sense of the situation. As Li and Peng* (2020) study indicates, cognitive coping, like emotional coping and social support, helps decrease anxiety.

Cognitive avoidance strategies, which involve thoughts of not focusing directly on the problem, are positively associated with negative emotions and negatively to tranquility. Chao (2011) indicates that the use of strategies focused on avoidance was related to a lesser degree to psychological well-being and the presence of greater negative affectivity. Simultaneously, behavioral avoidance coping strategies, which would imply carrying out activities to take one's mind off the situation, maintained a positive relationship both with positive and negative emotions, although with little strength.

More precisely, it was a positive relationship between focalization on problem-solving and positive reappraisal strategies with all the positive emotions (compassion, tranquility, hope, gratitude, and joy). There was also a positive relationship between negative self-focalization and open emotional expression strategies and all the negative emotions (boredom, loneliness, anger, frustration, fear, confusion, sadness, anxiety/concern, and despair). It should be mentioned that these two strategies, which are more broadly seen as emotional strategies (Sandín and Chorot, 2003), imply that things will go wrong, and being irritable with others, showed a negative relationship with tranquility.

Regarding behavioral coping approach strategies, which imply asking for help, a positive relationship with emotions such as confusion, fear, and despair was found, and to a lesser degree, there was a relationship with anxiety/concern, loneliness, compassion, and frustration. This result implies that, even when dealing with negative emotions, there is a distinction in its expression and management, supporting Lazarus and Folkman's coping theory (1984).

At the same time, seeking social support was positively related to the emotions associated with uncertainty, such as fear and confusion, compassion, sadness, despair, and, to a lesser degree, to some more favorable emotions such as gratitude and joy. These findings suggest that it is less probable that students seek help from friends and family when they feel angry, frustrated, bored, or alone, but they may seek help if experiencing fear or confusion during the lockdown. In this regard, the results of Li et al. (2020) confirmed that social support has a significant negative predictive effect on anxiety, which is also present during pandemics. Finally, turning to religion as a strategy to cope with lockdown was positively related to hope, joy, gratitude, compassion, and fear.

Results also showed that the coping strategies used through a cognitive approach, cognitive avoidance, and behavioral avoidance correlated significantly with all self-regulated learning dimensions, the first and third positively, and the second negatively; in the first case, by focusing on the situation and generating positive thoughts about it, whereas in the second case, thoughts have a negative component. In the third case, the person involves him or herself in activities that contribute to more pleasant experiences of living in adverse situations.

Focalization on problem-solving and positive reappraisal were the coping strategies with the strongest association to each of the self-regulated learning dimensions. Both are considered generic strategies, focused on rationality and showing a positive relationship with cognitive coping approach strategies. While positive reappraisal focuses on using concrete actions to correctly manage the situation, a positive sense of what is being lived is given in positive reappraisal. De La Rosa-Rojas et al. (2015) stated that problem-solving strategies or the search for information are active coping behaviors and are most frequently associated with greater competence and positive functioning.

A proactive approach to seeking social support was related to all the self-regulated learning dimensions, although the relationship's strength was meager. This type of strategy, as shown in the literature (Karabenick and Gonida, 2018), is based on searching for support from classmates, teachers or other professionals, and even family members, and has a lot in common with other self-regulated learning strategies, when facing a lack of progress toward the achievement of the desired academic goals. It should be noticed that, although turning to religion

correlated significantly with the different dimensions of self-regulated learning, the strength of the relationship was also low. Finally, as was to be expected, negative self-focalization and open emotional expression, which imply poor emotional management, showed a negative relationship with all the dimensions of self-regulated learning. This same inverse relationship happened in cognitive avoidance strategies, which may imply negation or an unrealistic view of the situation.

Mediation of Coping Strategies Between Emotions and Self-Regulation of Learning

This study focused on the role of coping as a mediating agent in the relationship between emotions and student self-regulated learning. In general, results show the mediating role of approach coping strategies between emotions and self-regulated learning, but there is not a significant relationship between avoidance coping strategies and self-regulated learning. According to the theoretical bases on coping on which this study is based (Billings and Moos, 1981; Lazarus and Folkman, 1986; Lazarus, 2006), active strategies, such as problem-centered strategies, tend to be most desirable (Folkman and Lazarus, 1980), while avoidance strategies are the least desirable (Lazarus, 2006). Based on the results of this study, it is important to underline the positive impact active strategies have on self-regulated learning processes (planning, monitoring, control, and reflection) that allow students to get involved in and achieve learning in online environments.

The fact that positive emotions are associated with self-regulated learning, while negative emotions are not, is consistent with previous research (De la Fuente et al., 2020), indicating that maintaining positive emotional states promotes more significant learning involvement. Likewise, as Hendrie and Bastacini (2020) state, positive and negative emotions influence people's judgment of their performance. It is, therefore, necessary to consider aspects of a student's cognitive and emotional ability in relation to their academic involvement.

Regarding the role of participants as students and given that self-regulated learning indicators are observed, we can infer that students recognized themselves as capable of handling situations such as fulfilling assignments, and connecting to synchronous sessions, etc. This is complemented by the possibility of seeking support from others, as an additional resource for their management, also favored by the technological resources available. Moreover, these findings suggest that, in general, participants had personal resources, allowing them to reduce their vulnerability to threats and favor more effective coping.

These findings are novel because they offer clear evidence about the positive association between self-regulated learning and approach coping strategies (De la Fuente et al., 2015). On the contrary, avoidance coping strategies, which imply not thinking about the problem and poor emotional management, do not contribute to committing oneself and making an effort to learn while faced with circumstances involved in the pandemic lockdown. Therefore, we can conclude that approach coping strategies focused on the problem and personal reappraisal promote self-regulated learning, while avoidance coping strategies, such as not thinking about worries, inhibit it.

In summary, this research has shown, together with the findings by Lazarus and Lazarus (2000), that approach (active) coping strategies guided toward a positive reappraisal of the situation (CCA, PRE, CAC), contribute to personal well-being, in this case, to mitigate the effects of lockdown during the pandemic. At the same time, the focalization on problem-solving (FPS) coping strategy and analyzing the causes of the situation in order to face it, allow the students to carry out different strategies, ones they have tried in the past, or to implement new ones, to counteract adverse effects and continue with their studies online.

If lockdown has created anxiety, frustration, and boredom in students, emotions such as tranquility, hope, gratitude, and joy are the result of a positive reappraisal of the importance initially given to the pandemic, as well as performing different activities that bring out the most favorable aspects of the situation, and maintain performance during online academic activities. Therefore, activating these coping strategies constitutes a key mechanism to positively face problems and challenges, generating positive emotions essential for the self-regulation of learning. Simultaneously, such strategies help protect them from emotions such as loneliness and lack of interest, impeding academic involvement in a self-regulated manner. In light of the results presented, we consider that this study contributes to the corpus of knowledge on the study of self-regulated learning as a complex process in which the affective, motivational, cognitive, and behavioral aspects are closely related (Zimmerman, 2008; De la Fuente et al., 2015). Therefore, approach coping strategies via the mediating role they play in generating positive emotions are fundamental to this process.

These results allow for the identification of important educational implications. From our findings, we consider it essential that professors help university students understand the relevance of active coping strategies for the better management of uncertain circumstances out of their control, which they are currently experiencing due to the pandemic. It is also necessary to consider each student's reality and the use of virtual teaching and learning models focused on the student that promote autonomous and self-regulated learning in environments of warmth and acknowledgment of the other. Today more than ever, universities and teachers should be creative in supporting the students' educational processes properly, using their resources to respond to the students' affective and learning needs from the new challenges the pandemic has left.

Despite the good results, one aspect to highlight is that the majority of the students who took part in this study lived with their families in urban areas and with relatively adequate living conditions to continue their studies online during lockdown; therefore, it is inferred that these aspects constitute one more factor in mitigating students' anxiety caused by uncertainty and social distancing. We believe it necessary in future research to increase the number of participants from different regions of the country, especially students from semi-urban and rural areas. The results also pose new questions regarding the possible use of approach coping strategies and

self-regulated learning processes based on the students' profile. Another essential aspect of future research would involve a comparison among universities in different countries to enable a transcultural analysis of the variables seen in this study, which would enable a greater understanding of the needs of university students in a situation of this magnitude, allowing teaching staff to support their emotional well-being and the achievement of their academic goals during and after lockdown.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Universidad Popular Autónoma del Estado de Puebla Ethics Committee. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

MLG analyzed the data and drafted the initial version of the article. All authors contributed to the conception and design of the study, data collection, results interpretation, and approval of the final version.

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Navigating the Same Storm but Not in the Same Boat: Mental Health Vulnerability and Coping in Women University Students During the First COVID-19 Lockdown in the UK

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Having a mental health diagnosis in both general and student populations has been found to be a risk factor for negative coping and increased psychological distress during the COVID-19 pandemic. Drawing on a subset of data from a large contemporaneous research study, this report explores the experiences of 36 women students with and without reported pre-existing mental health diagnoses during the first UK lockdown, in spring 2020. Specifically, the data explored self-reported coping with the restrictions, with the abrupt move to online learning, and the loss of support; as well as students' perceived strengths and difficulties in balancing their student role with family roles such as being a partner and/or a parent. Students with a pre-existing mental health diagnosis reported higher levels of loneliness compared to a matched sample of non-students, and more avoidant coping and negative emotional coping than students without a diagnosis. Qualitative data illustrate how parenting intersects with well-being and stress as both a protective and risk factor for women university students. This research report adds to the evidence base on the impact of the COVID-19 pandemic on the student population, and how pre-existing mental health diagnoses intersect with coping behaviours and vulnerability in women students. Exploration of potential vulnerabilities can provide opportunities for targeted support, and identifying effective coping has the potential to inform effective interventions.

Keywords: mental health, women students, COVID-19, coping, vulnerability

INTRODUCTION

Higher Education and Student Mental Health

According to the 2020 University Student Mental Health Survey (Pereira et al., 2020) prior to the COVID-19 pandemic, more than one in four (26.6%) students in UK Universities reported having a current mental health diagnosis. Furthermore, students with a prior mental health diagnosis and those who identify as female were at risk of further mental health decline in the absence of continued support after starting university (Pereira et al., 2020).

The number of students declaring a pre-existing mental health diagnosis to their university in the UK more than doubled since 2014/15 and, consequently, the vast majority (95%) of higher education providers in the UK reported an increase in demand for student counselling services

(All Party Parliamentary Group on Students, 2020) and found themselves under increased pressure from government to provide more psychological and mental health support for students (Pereira et al., 2020). Widening participation in Higher Education (HE), led to increases in numbers of students from wider socioeconomic backgrounds. Concurrent decreases in government funding, increases in tuition fees, student loans, and reduced access to specialist mental health services created a situation of reduced support and increased financial pressures on students (Denovan and Macaskill, 2016). Student/staff ratios in UK Universities increased and support services have not kept pace with student numbers (Macaskill, 2013) leading to a reduction in available resources.

The unprecedented COVID-19 pandemic occurred in the context of these already existing concerns related to university students' mental health in general. This research report explores issues at the intersection between student mental health and the impact of the COVID-19 lockdown in the UK. Hence, the paper will firstly summarise the (emerging) studies reporting specifically on student mental health during the pandemic, and then will draw parallels with studies on the impact of the pandemic on mental health in the general population.

Student Mental Health During the COVID-19 Pandemic

In addition to the academic and transitional stressors that university students ordinarily navigate, the COVID-19 pandemic brought novel and heightened challenges. Students have arguably suffered a 3-fold impact of the pandemic: their education has been disrupted by the abrupt change to remote online learning; social and peer group relationships have been negatively affected by reduced contact due to lockdowns and ensuing isolation; and graduate employment prospects were diminished due to the economic downturn brought by measures to control the virus's spread.

Struggling with the pandemic situation is not specific to students, but there are aspects of their experience which are uniquely challenging to navigate. Living away from home for the first time in their first year, being unable to build new friendships for social support and being prevented from travelling to visit their families can reasonably be understood to exacerbate feelings of loneliness and a sense of isolation (National Union of Students, 2020). Over half of UK university students reported that their mental health was in a worse state as a result of the COVID-19 situation (Hewitt, 2020). Only 20% of those struggling with their mental health during the pandemic reported seeking help (National Union of Students, 2020), suggesting that students who are in a position of vulnerability are also unable/unwilling to access support, or that accessing it is difficult. In 2018, Universities UK (Universities United Kingdom, 2018) developed a policy framework which advocates a holistic approach. This recommended that universities make mental health a priority and is thus seen as essential to successful university life. However, the low uptake in seeking support suggests that improvements are still needed.

Within the context of the pandemic, *the student experience* has been significantly affected. The COVID-19 pandemic has impacted students in different ways: for some, the greatest threat was infection with coronavirus; for others, the lockdown measures have been a dominating source of distress. Surveys of UK students since the beginning of the pandemic suggest high levels of stress and anxiety: 49% of students reporting they were "really worried" about loneliness and 42% being required to self-isolate (Save the Student, 2020); and 63% felt that COVID-19 was either a major or significant risk to their mental or physical health (Office for National Statistics, 2020).

Conversely, there are students who have benefitted from the changes to everyday life brought about by the pandemic: remote working and learning may have removed the logistical stressors such as travel costs and time. Individuals who struggle with the social aspects of education, may have benefitted from remote teaching and learning (Dvorsky et al., 2020), for example a survey of UK students, reported that more than half (59%) were very or quite satisfied with the online learning that has replaced face-to-face teaching (Hewitt, 2020).

The pandemic has posed challenges for all sectors of education and tested their organisational agility. The universities found themselves under pressure to prioritise changes that can be made effectively, within time constraints and cost/resource limitations. Universities around the world were in different positions in terms of preparedness for these forced changes. According to a report comparing 20 countries' higher education responses to the pandemic (Crawford et al., 2020) adaptations within UK higher education focused on Universities' ability to deliver curriculum content remotely during lockdown(s) and ensuring safety on campus. The priority to support students virtually without compromising academic quality, is consistent with some of the other countries, including China.

These preliminary findings on student mental health during the pandemic mirror the emerging trends from the general population. In order to enhance the understanding of the complex interplay between the pandemic and the pre-existence of mental health vulnerabilities and coping, the parallel findings from general population are considered below.

COVID-19 Pandemic: Vulnerabilities, Mental Health, and Coping

Research in the UK reported higher than usual levels of stress, depression and anxiety in the general population during the COVID-19 pandemic (Jia et al., 2020). Such findings are not surprising when considered in the context of the multiple life-stressors that co-occurred in such an abrupt manner within a short period of time, including serious/life-threatening illness, bereavement, social distancing, and unemployment. All of these are considered to be significant threats to psychological health, and as such a degree of struggling to cope in these circumstances is to be expected (Jia et al., 2020; Polizzi et al., 2020). What is not yet clear, is whether the deleterious effects of the pandemic on mental health are a normal reaction to an unusual situation, and if adverse outcomes will abate when the crisis has passed, or whether they will endure and require intervention.

Consistent emerging findings indicate that vulnerability and inequality that existed prior to COVID19 have been exacerbated, resulting in those vulnerable beforehand suffering the most deterioration during the pandemic (Kousoulis et al., 2020; Pierce et al., 2020). Minority ethnic groups have suffered disproportionate COVID-19 mortality and morbidity (NHS, 2020). Women and young people are reported to have higher levels of anxiety and depression prior to and during the pandemic (Niedzwiedz et al., 2020; Fancourt et al., 2021). Other risk factors identified for worsened mental health are lower educational attainment, low income and pre-existing mental health diagnoses. Circumstances such as living alone or with children also increased risk (Fancourt et al., 2021). Losing access to in-person support and community resources as a result of imposed lockdowns impacts most those who rely on these sources of support to cope with daily life. Thus, people with pre-existing mental health diagnoses have been detrimentally affected by both the disruption to support services and their usual coping (Jia et al., 2020; Kousoulis et al., 2020).

Several UK reports indicate that mental health, when compared to pre-COVID levels, has deteriorated more in women (Daly et al., 2020) and parents of young children (Pierce et al., 2020; Cheng et al., 2021). Responsibilities such as homeschooling, shopping, food preparation, cleaning, informal care work, and maintaining relationship contacts, falls largely to women around the world (Power, 2020), which may account for increased stress in women during the pandemic (Cheng et al., 2021). Adults living with children report higher anxiety, but lower levels of depression (Niedzwiedz et al., 2020) and lone mothers are identified as a particularly vulnerable group (Xue and McMunn, 2020).

Coping With the COVID-19 Pandemic

Coping responses modulate individual experiences of stress, determining affective and behavioural outcomes (Fluharty and Fancourt, 2020). Differing models of coping propose categorisation of coping behaviours as adaptive or maladaptive strategies, however the context is key in understanding the effectiveness of coping. For example, social support is recognised as a positive adaptive coping; however lockdown limited access to social support strategies by curtailing and reorganising social contacts. Specifically for students, this meant meeting fewer people, being confined with a small number of housemates, a return to their pre-university home or somewhere else.

Theoretical models (Stanisławski, 2019) categorise approaches to coping into *problem focussed coping* where individuals seek to address the cause of stress; and *emotion focussed coping* whereby they attempt to deal with the troubling emotions caused by stress. There is further delineation of strategies within these dimensions, for example, distinguishing between positive emotional coping and negative emotional coping (Stanisławski, 2019). An examination of the coping used during COVID-19 lockdown in a large scale UK study (Fluharty and Fancourt, 2020), found that women used active, problem and avoidant coping strategies more than men; and that young adults and people with pre-existing mental health diagnoses used more avoidant strategies (such as denial), but also that they turned more to supportive coping (accessing support services).

Similar trends were identified in populations across the globe. A report into coping behaviours across 16 countries identified the most frequent to be: watching television, social networking, listening to music, sleeping, domestic jobs, eating well, and completing unfinished work (Sameer et al., 2020). In Australia, females reported higher levels of distress than males, and positive coping such as reframing, acceptance, and humour were linked to better mental health (Gurvich et al., 2020). Conversely, negative coping behaviour such as avoidant strategies have been associated with increased distress, and were also negatively associated with well-being (Dawson and Golijani-Moghaddam, 2020). Moreover, negative coping strategies such as self-blame, venting, behavioural disengagement and self-distraction were linked to poorer mental health (Gurvich et al., 2020). Varma et al. (2021) found factors that negatively impacted successful coping were poor sleep, lower resilience and loneliness. They also report that younger age groups are particularly vulnerable to stress, anxiety, and depression and need more support. A study in Italy reported that a resilient coping style during the lockdown was negatively associated with depression, and specifically that engagement with active and flexible strategies of coping led to less depressive symptoms (Roma et al., 2020).

Shedding light on individual vulnerabilities provides opportunities for targeted support (Kousoulis et al., 2020). Identifying effective coping strategies has the potential to inform interventions to support individuals navigate the uncharted waters of the COVID-19 pandemic now and other global health crises in future. Crucially, understanding the link between pre-existing mental health diagnoses and increased psychological distress during the COVID19 pandemic will ensure support is targeted at the most vulnerable individuals.

The Study Rationale

The "*same storm, different boats*" (Noonan, 2020) metaphor gained poignancy in discourses about how the pandemic has affected all lives across the board, while also shedding light onto individual differences and how these render some individuals more vulnerable, and some more able to cope and adapt. Emerging findings on mental health during the pandemic point toward deterioration throughout the population; but, importantly, that certain groups are more vulnerable: women, individuals with pre-existing mental health diagnoses and those living with young children. Individuals with the vulnerabilities identified in the general population are also represented in the higher education student population (The Higher Education Statistics Agency, 2020) and thus are likely to experience the compounded effects of the pandemic on their mental health. Although robust findings on the impact of the pandemic on students' mental health are yet to emerge, students are reporting that their mental health has been negatively affected (Pereira et al., 2020). However, there is limited understanding to date how individual vulnerabilities have contributed to the impact of the pandemic on student mental health.

This research report explores the experiences of women students during the first UK lockdown in the spring 2020,

specifically: how they reported, retrospectively, their coping with the restrictions, the abrupt move to online learning, and with balancing their student role with family roles such as being a partner and/or a parent. The ultimate aim is to increase understanding of individual mental health vulnerabilities to the COVID-19 situation, which in turn can provide opportunities for targeted support, while distinguishing effective coping strategies has the potential to inform interventions.

METHOD

This report focusses on a sample of UK women students ($N = 36$) enrolled in HE institutions in the UK during the first COVID-19 lockdown. The data for this report were extracted from a larger dataset gathered as part of a contemporaneous large-scale study, *Families Un-Locked* (Misca, 2020, 2021). This research study was launched in the UK August 2020 in partnership with Relate, the relationship charity (https://www.relate.org.uk/), and aimed to explore the medium and long-term effects of the pandemic related stressors on families and relationships. The research took an exploratory stance to understanding the impact of the lockdown and therefore employed a mixed method design, eliciting participants' reflections, and recollections of their behaviours and feelings during the first and strictest lockdown in the UK, which took place during March-June 2020. Data were collected post-lockdown, through a purposefully designed survey created specifically for this exploratory study. This included a combination of questions eliciting information about respondents' demographic and relationships in general and items aimed at the COVID-19 lockdown and post-lockdown context, assessing key variables related to family and relationships, coping, health, and well-being. Given the exploratory nature of the study and the unprecedented circumstance of the lockdown, the items' development was informed by the *Coping Circumplex Model* (Stanisławski, 2019) and the *Family Resilience Framework* (Walsh, 2016). As the data were collected *after* the first lockdown ended in the UK, it was therefore not feasible to use standardised measures of behaviours or mental states which occurred *during* the lockdown (as such measures usually rely on a 2–4 week retrospective time frame).

Research data analysed for the purpose of this report were collected during August-November 2020 and comprised participants' retrospective self-reports about their use of positive and negative coping (behaviours, feelings) during the first lockdown (March -June 2020) as compared to before the lockdown (pre-March 2020). Participants were asked to rate their coping *via* two multiple-questions sections, such as:

1. "During the COVID-19 lockdown, many people experienced lifestyle changes. Rate each item below indicating the changes you experienced compared to what it was like before lockdown"; responses to items were rated on a 3 point scale as *less, about the same, more*.

2. "During the COVID-19 lockdown, how have you been feeling?"; responses to items were rated on a 3 point scale: *most of the time, some of the time, not at all*)

The items addressed aspects such as (for details see **Table 1**):

- Positive coping—i.e.: spending more time on hobbies, doing exercise; positive emotional coping such as reframing; and positive social support connecting with friends/family remotely;
- Negative coping—i.e.: eating more, drinking more, having trouble relaxing, not feeling positive about the future.

The impact of the pandemic on family relationships were assessed in two sections of the survey, one related to couple relationship and one to parenting.

- The *couple relationship* was assessed by 2 multiple set questions. One set of questions regarded couple behaviours: "How has the lockdown impacted your relationship?," with answers rated on a 3 point scale (*less, about the same, more*), example items: "we have argued," "we have supported each other" etc. The second set comprised statements rated on a 4 point scale (*strongly agree to strongly disagree*) on items such as "Things were bad already and the lockdown has made it worse," 'We are closer than before," etc. (for details see **Table 2**).
- *Parenting practices* were assessed by a question: "During the lockdown how have you managed with the children?" rated on a 3-point scale (most of the time, some of the time, not at all) on items including being overwhelmed by childcare responsibilities; juggling childcare and work during lockdown, being anxious about their child's education, etc. (for details see **Table 3**).

As a proxy measure of mental health vulnerability participants were asked the following question "Have you ever been diagnosed with a mental health condition?" thus enabling to distinguish between two categories of participants: those with pre-existing mental health diagnosis and those without.

In addition, *qualitative data* from participants were obtained *via* two open ended questions in the survey, which asked participants to look back over the lockdown period, and report in their own words what have been their personal strengths and difficulties/challenges.

Primary research participant group were adult individuals aged 18 years and over living in the UK during the COVID-19 pandemic and were recruited with support from Relate, through opportunity sampling, including social media advertising as well as snowball techniques. Research data were collected *via* an anonymous on-line survey and managed using the Online surveys, a secure, web-based software platform hosted by Jisc.ac.uk.

Ethical approval was granted for all aspects of the study by the College of Business, Psychology & Sport Research Ethics Panel at the University of Worcester. Potential participants were directed to study information *via* a weblink; those who wished to take part (after being provided with full information about the study were required to confirm that they met eligibility criteria (being aged

TABLE 1 | Coping during COVID-19 lockdown[a].

	Full student sample (*N* = 36)		PMHD[b] students (*n* = 14)		NPMHD[3] Students (*n* = 22)	
	n	%	*n*	%	*n*	%
Problem-focused coping[a]						
Positive						
Going out (for walk, exercise)	15	42.9	5	35.7	10	47.6
Spending time on my hobbies	12	34.3	2	15,4	10	45.5
Reading	18	50	6	42.9	12	54.5
Cooking	20	55.6	6	42.9	14	63.6
Exercising	10	27.8	2	14.3	8	36.4
Keeping busy	7	19.4	3	21.4	4	18.2
Social support—instrumental						
Spending time connecting with family and friends on social media	15	41.7	6	42.9	9	40.9
Spending quality time with people in my household	20	55.6	9	64.3	11	50
Avoidance						
Drinking alcohol	12	33.3	5	35.7	7	31.8
Smoking	4	11.1	1	7.1	3	13.6
Eating	15	41.7	9	64.3*	6	27.3
Being bored	7	19.4	2	14.3	5	22.7
Emotional coping						
Positive						
Enjoyed having time for myself (most or some of the time)	30	83.4	11	78.5	19	86.3
Felt positive about the future (most or some of the time)	26	72.2	7	50	19	86.3*
Social support—emotional						
Enjoyed connecting with friends/family remotely *via* technology	8	22.2	3	21.4	5	22.7
Enjoyed spending more time with those I live with	17	47.2	5	35.7	12	54.5
Negative						
Felt anxious	10	27.8	6	42.9	4	18.2
Felt lonely	12	33.3	6	42.9	6	27.3
Had trouble relaxing	11	30.6	7	50*	4	18.2
Felt more tired than usual	19	52.8	9	64.3	10	45.5
Missed seeing family	11	30.6	4	28.6	7	31.8
Missed seeing friends	15	41.7	4	28.6	11	50

[a]*Reflects the number and percentage of participants answering "more [than before lockdown]" or "most of the time" [during lockdown].*
[b]*PMHD, Pre-existing Mental Health diagnosis.*
[c]*NPMHD, Non Pre-existing Mental Health diagnosis.*
**p < 0.05 (for χ²-tests).*

and tentatively propose implications for student support. Chi-square test (χ^2) were performed to test for significant (a $p < 0.05$ was considered statistically significant) associations between coping reported by participants with a pre-existing diagnosis, compared to participants who did not and between student and non-student participants. Qualitative data derived from the free text in the survey responses were used to corroborate the emerging associations in findings and further explored for emergent coping themes, across responses from participants with PMHD to NPMHD.

RESULTS

Demographic Variables

The 36 women students in the analysis sample were aged between 18 and 64 (m = 39.89, SD = 13.97, mode 18, 34). The age

18 and over) and to voluntarily consent to take part. Participants then proceeded to complete an online survey.

Analysis Strategy

In this report the aim was to compare female students who reported a *pre-existing mental health diagnosis (PMHD sub-group)* prior to the pandemic across a number of self-ratings with those who *did not have a pre-existing mental health diagnosis (NPMHD group)*. For comparison purposes, a random case-matched sample of non-students was extracted from the *Families Un-Locked* study data, matched on gender, pre-existing mental health diagnosis, couple relationship, and parent status.

Given the small sample size which limits the extent of statistical analysis, the reporting of results is cautious, identifying emerging associations and aiming to inform future research,

TABLE 2 | Couple relationships during COVID-19 lockdown.

	Non-student couples (N = 36)		Student couples (N = 29)		PMHD[a] students (n = 11)		NPMHD[b] students (n = 18)	
	n	%	*n*	%	*n*	%	*n*	%
Couple relationship[c]								
Positive								
Supported each other more as a couple	17	47.2	16	55.2	6	54.5	10	55.6
Talked more as a couple	12	33.3	12	41.4	4	36.4	8	44.4
Done things together more	19	52.8	10	34.5	3	27.3	7	38.9
Felt positive about our relationship	8	22.2	8	27.6	2	18.2	6	33.3
Felt close to partner	15	41.7	8	27.6	2	18.2	6	33.3
Lockdown has been a positive experience for us [agree or strongly agree]	18	50*	14	50	5	45.5	9	52.9
We are closer than we were before [strongly agree]	15	41.6	18	62.1	7	63.6	11	61.1
Negative								
We have argued more	14	38.9	9	31	4	36.4	5	27.8
We have grown apart	15	41.7	7	24.1	2	18.2	5	27.8
We have wound one another up more	15	41.7	9	31	4	36.4	5	27.8
Disagree on daily tasks more	7	19.4	9	31	5	45.5	4	22.2
We have felt more tension/strain	21	58.3*	12	41.4	7	63.6	5	27.8
We worried a lot about the pandemic causing tension in our relationship	12	33.4*						
Things were bad and lockdown has made it worse [strongly agree]	8	22.2	8	27.6	3	27.3	5	27.8
Lockdown put a real strain on our relationship [strongly agree]	16	44.5	14	48.3	5	45.5	9	50

[a] PMHD, Pre-existing Mental Health diagnosis.
[b] NPMHD, Non Pre-existing Mental Health diagnosis.
[c] Reflects the number and percentage of participants answering "more [than before lockdown]" or "most of the time" [during lockdown] or "strongly agree."
*$p < 0.05$ (for χ^2 tests).

distribution was broad which can be explained by the fact that data were extracted from a larger study which did not target students in particular.

Nevertheless, this offered the opportunity to explore a non-traditional group of women students, the majority being in a committed relationship and just over a third (37%) were parents of children aged under 18 and living in their household (between 1 and 4 children). Over a third (39%) of the women reported a pre-existing mental health diagnosis and its prevalence in this group is higher than that reported in the 2020 University Student Mental Health Survey (26.6% reported in Pereira et al., 2020).

Comparing Student vs. Non-students

Between group analyses on coping revealed no significant differences between students and non-students. When couples ($n = 65$) were compared across the two samples on the impact of the lockdown on their couple relationship, more non-students than students reported that they felt tension/strain in their relationships ($\chi^2 = 10.842$, df = 3, $p = 0.013$). In addition, more non-students than students strongly disagreed with the statement "Lockdown has been a positive experience for us" ($\chi^2 = 16.755$, df = 3, $p = 0.001$) and strongly agreed with the statement "We worried a lot about the pandemic,

	Non-student Parents (N = 13)		Student Parents (N = 14)		PMHD[a] students (n = 8)		NPMHD[b] students (n = 6)	
	n	%	n	%	n	%	n	%
Parenting[c]								
Difficulties								
Felt overwhelmed by childcare responsibilities [some or most time]	8	61.5	11	78.6	6	75	5	83.3
Been anxious about their child's education	6	46.2	6	42.9	2	25	4	66.7
Struggled with routine and structure [some or most time]	9	69.2	11	78.6	7	87.5	4	66.7
Hard to juggle childcare and work [some or most time]	10	76.9*	11	78.6	6	75	5	78.6
Struggled to cope with managing their children [some or most time]	6	46.2	9	64.3	6	75	3	50
Not had enough time to themselves [most of the time]	11	84.6*	5	35.7	4	50	1	16.7
Strengths								
Children had enjoyed being at home [some or most of the time]	11	84.6	14	100	8	100	6	100

[a]*PMHD, Pre-existing Mental Health diagnosis.*
[b]*NPMHD, Non Pre-existing Mental Health diagnosis.*
[c]*Reflects the number and percentage of participants answering some or most of the time combined.*
*p < 0.05 (for χ^2-tests).

which is causing tension in our relationship" ($\chi^2 = 8.955$, df = 3, $p = 0.03$).

A similar trend was apparent when students and non-students were compared on their parenting and managing their children during lockdown: more non-student (than student) parents reported difficulty to juggle childcare and work ($\chi^2 = 7.640$, df = 2, $p = 0.022$), supervising their children or "keep a constant eye on what my children are doing" ($\chi^2 = 6.639$, df = 2, $p = 0.036$) and having to keep children busy or "entertaining or playing with them" ($\chi^2 = 6.794$, df = 2, $p = 0.033$) and overall, more reporting not having enough time for themselves ($\chi^2 = 7.056$, df = 2, $p = 0.029$). Collectively, these findings tentatively suggest that more non-student couples and parents felt under pressure during the lockdown due to balancing their work roles and those of partner/parent.

Henceforth the results are reported as comparisons between students and non-students where relevant, as well as within sample comparisons and between the sub-group of students with pre-existing mental health diagnosis (PMHD subgroup $n = 14$ and those without (NPMHD subgroup $n = 22$).

The Impact of the Lockdown on Women Students' Pre-existing Mental Health Difficulties

The majority (71%) of women students who reported having a pre-existing mental health diagnosis, which pre-dated the first lockdown, reported that their mental health had been *made worse* by the lockdown. This finding on the negative impact of the lockdown on the mental health is concurrent with existing research with both students (Hewitt, 2020) and the general population (Jia et al., 2020; Kousoulis et al., 2020; Polizzi et al., 2020; Fancourt et al., 2021) samples of individuals with pre-existing mental health diagnoses.

Coping With the Lockdown

As illustrated in **Table 1**, data suggest a picture of women students who have had to adapt with flexibility to the changes over the COVID-19 lockdown period.

Loneliness

Around a third of students (34%) reported that they felt lonely most of the time during lockdown and missed seeing family (30%) and friends (42%) most of the time. Significantly more students with PMHD reported feeling lonely most of the time during lockdown than non-students with PMHD ($\chi^2 = 6.552$, df = 2, $p = 0.038$). However, there were no significant differences found between students with or without pre-existing mental health diagnoses.

These results echo findings by Bu et al. (2020) that being a student was a risk factor for higher loneliness than non-students; and that women and people with pre-existing mental health diagnoses and students were significantly more likely to be in the highest loneliness category. Women reported more socially

supportive relationships prior to lockdown (Bu et al., 2020) making it possible that the sense of isolation was more acute when this support was less accessible. Loneliness was also reported to be a risk factor which negatively impacted coping (Varma et al., 2021).

Anxiety

Just over a quarter of students (28%) reported feeling anxious *most of the time* during the lockdown; and just under a third had trouble relaxing *most of the time*; however, no significant differences were found in reported feelings of anxiety between those with pre-existing mental health diagnoses and those without.

This finding is in tandem with reports that there has been a general decline in well-being throughout the population due to the circumstances (Jia et al., 2020; Polizzi et al., 2020) and data collated by surveys on students (Save the Studen, 2017; National Union of Students, 2020; Office for National Statistics, 2020). Also, pre-pandemic adults with pre-existing mental health diagnoses reported worse levels of mental health but this gap did not widen during the pandemic (Fancourt et al., 2021).

Coping Behaviours

A range of coping behaviours during the lockdown were reported as illustrated in **Table 1**. Among positive coping strategies, around 40% of students reported going out *more* (for exercise or walks, as permitted at the time) and spending *more* time connecting with family and friends remotely. Around a third spent *more* time on hobbies and just over a quarter (28%) exercised *more*. A third reported drinking more alcohol than before the lockdown and 40% eating more which are negative coping strategies raising the risk for mental and physical health. This mixture of positive and negative coping is consistent with trends described in research elsewhere (Fluharty and Fancourt, 2020).

Overall, more students with PMHD reported avoidant coping and negative emotion focussed coping during lockdown: eating more during lockdown ($\chi^2 = 7.387$, df = 2, $p = 0.025$), having had trouble relaxing during lockdown ($\chi^2 = 5.653$, df = 2, $p = 0.05$), and not feeling at all positive about the future ($\chi^2 = 6.085$, df = 2, $p = 0.048$). The association persisted when PMHD students were compared with PMHD non-students: significantly more students with PMHD reported not feeling positive about the future than non-students with PMHD ($\chi^2 = 6.328$, df = 2, $p = 0.042$), indicative of a level of hopelessness in the students with mental health issues. This concurs with findings from a study of Polish students that students with PMHD can be particularly vulnerable and require urgent support (Rogowska et al., 2020).

Adults with pre-existing mental health diagnoses have been found to be more likely to use avoidant coping during the pandemic (Fluharty and Fancourt, 2020) and these coping behaviours have been linked to increased psychological distress (Dawson and Golijani-Moghaddam, 2020) in a cycle of ineffective coping which can be harmful to physical health (increased substance use) and psychological health (Gurvich et al., 2020).

Students with PMHD also reported (*via* the free text items) specific behaviours indicative of avoidant coping, for example: *"Staying busy";"plodding on and allowing the doldrums to pass,"* both suggesting emotional disengagement; and overall less emotional coping such as:

"Feeling very tired, having very little motivation, feeling anxious and depressed"
"Loneliness and realising how isolated I am compared to my family and friends"

Although not reaching statistical significance, students with NPMHD reported engaging more in positive coping during lockdown, such as spending more time on hobbies and exercising. These two types of activities were allowed under lockdown conditions, suggesting that these students engaged in positive adaptive behaviour by making the most of what was available to them, and generally re-framing the restrictions in positive terms such as the quotes below illustrate:

"I've been able to build on strong friendships, resilience, common sense in the face of changing advice and guidance."
"Routines, generally still eating healthily and exercising, maintaining a strong relationship with partner."
"Spending time with my parents who I don't usually see as often when I'm away for uni helped."

Social-Focused Coping

Because social interactions were severely curtailed during the lockdown, individuals who habitually relied on social-focused instrumental coping were obviously unable to draw on such strategies, as illustrated by students' testimonies about their personal challenges during the lockdown:

"Not being able to go to school/college, having to work remotely. Feeling isolated. Worried about the effects of isolation on my children- not seeing their friends, not knowing how long this was going to last, Not knowing which information to believe as it kept changing."

The quote above also illustrates the confusion created by the conflicting information provided at times regarding the virus and the pandemic; and a student reported disengaging from media as a "strength" and positive coping strategy:

"Staying calm, stopping social media and media connectivity, accepting."

Problem focused coping focusses on the source of stress and attempts to deal with it (Stanisławski, 2019). Control over the situation was severely curtailed as were opportunities to affect it. This choice demonstrates one area of managing media contact and exerting appropriate control where it was possible. They also state "accepting" which is a positive emotional focussed strategy based on acceptance of the reality of the situation (Fluharty and Fancourt, 2020).

Couple Relationships and Parenting

Faced with the unavailability of the social support from direct contact with friends, some individuals turned for support to family relations within household, with both partner relationships and parenting featuring among reported strengths and challenges. Participants perceived impact of the lockdown on their couple relationship and parenting are summarised in **Tables 2**, **3**, respectively.

Significant differences in coping between students in couple relationships ($N = 29$) with PMHD ($n = 11$) and without (NPMHD, $n = 18$) were detected in our data (**Table 2**), with those with PMHD reporting eating more ($\chi^2 = 4.974$, df $= 1$, $p = 0.026$) and less feeling positive about the future ($\chi^2 = 6.626$, df $= 2$, $p = 0.036$) during the lockdown, a trend similar to that in the whole sample of students. However, there were no significant differences in reported impact of lockdown on their couple relationships or parenting. Within the student parents subgroup ($n = 14$), there were no significant differences between those with PMHD and without (NPMHD) in terms of their coping or managing children (**Table 3**).

The majority of participants were in a committed relationship and these featured among the strengths mentioned:

> "Maintaining a strong relationship with my partner"
> "Strong relationships with partner and friends"

Parents with young children were identified as a vulnerable group in previous studies, suggesting that their mental health was negatively impacted with anxiety being higher but depression lower than in non-parents (Niedzwiedz et al., 2020; Pierce et al., 2020). This suggests that the ways in which parenting intersects with wellbeing are complex and nuanced: for some parenting acts as a protective factor, offering distraction and a sense of clear priorities, while for others, a pressure and additional concerns about children's well-being.

However, in our sample there were no significant differences between student parents and those who were not parents in terms of their reported coping and mental health impact. Moreover, student parents in our study ($n = 13$) described their role as parents and interactions with their children as both a strength and difficulty, as the quotes below from three different parents illustrate:

Parent 1:

> [Strength] "Have home schooled successfully and my daughter has made great progress….. Reassuring my daughter when she has been anxious and sad about lockdown"
> [Difficulty] "Feeling overwhelmed with solo parenting and feeling like I was doing a bad job of it."

Parent 2:

> [Strength] "Providing children with love"
> [Difficulty] "Guilt that my children were not having enough things to do. Lack of energy to provide entertainment for children"

Parent 3:

> [Strength] "I have kept boundaries with my children, forcing exercise and fresh air. Specific screen times, despite daily conflict when I do so. That's been my major stress!"
> [Difficulty] "Homeschooling, relationship with my teenage son. Setting a daily routine for my children. Battles with xbox/screen time for my children."

Reflections on Individual Strengths and Challenges in Navigating the Pandemic

Two items on the survey collected qualitative data detailing what participant's felt were their strengths and personal difficulties or challenges over the lockdown period. When identifying strengths, participants covered a variety of factors, including but not limited to practical skills (such as online shopping), spending more time on their hobbies, and personal traits (such as patience). Parents reported being focused on keeping children healthy and supporting their well-being. Describing challenges or personal difficulties participants reported struggling with a range of issues: family and relationship breakdown stressful social interactions on new norms (mask wearing and social distancing), negative coping behaviours (overeating, lack of self-belief) areas of life which have been impacted such as future employment concerns.

A trend became apparent in the style of language used. When reporting their strengths, students with pre-existing mental health diagnoses tended to describe things they had done to cope rather than internalised, personal strengths. For example, one student described as her strength:

> "Able to focus more on study without worrying about travelling and attending courses in the room."

And the extracts below described actions:

> "Carrying on with my work. Trying to bounce back through depression and other mental health issues"
> "Have carried on going, nearly finished my PhD"

By contrast, students who did not have a pre-existing mental health diagnosis, described their strengths during the lockdown as personal abilities, qualities/traits or personal resources such as money and pets:

> "My ability to be comfortable in my own company. My ability live small life. My determination to see things through. My ability to comply with rules. My ability to accept things as they are."
> "I am optimistic I like to have fun and connect with others I have lots of friends….. I volunteer I support others….. We have enough money I have pets…."

Although they also identified behaviours as strengths, these appeared to be more internalised by clearly attributing the behaviour to themselves:

> "Looking after my children. Keeping up my studies."
> "Learning that I am resilient. Listening to my children and sharing their worries and concerns."

The internalised language and self-attribution of strengths in students without pre-existing mental health diagnoses suggests a sense of self-efficacy and perceived control which are processes underpinning resilience (Dvorsky et al., 2020). Students with pre-existing mental health diagnoses reported challenges such as social isolation and lockdown preventing access to support, which have been identified as likely to add additional pressure on those with vulnerabilities (Jia et al., 2020; Kousoulis et al., 2020):

> "Not being able to access my normal coping mechanisms"
> "being isolated from family and friends"
> "Being away from my mum for four months as we are really close and usually see each other weekly"

They also identified difficulties suggesting negative coping behaviours or indicative of struggles to maintain mental well-being.

> "Motivation to cook, shower, get out of bed. Wanting to do anything that I used to enjoy eg reading painting, doing my makeup."
> "Feeling very tired Having little motivation. Feeling anxious and depressed. Having very little time on my own"
> "Over eating Under eating Lack of exercise Worse mental health"
> "Depression Shielding Lack of motivation Boredom Anxiety and family difficulties"

However, they also gave examples of positive coping behaviours, such as engaging in activities and re-framing.

> "I kept myself busy by learning how to bake which lifted the mood in the house"
> "Finding positives in the situation"

Engaging in substitute activities can be conceptualised as an avoidant coping strategy, however, in the lockdown context of home confinement, "keeping busy" was an adaptive strategy, illustrating the context-dependent value of coping. Coping strategies that can be adaptive in certain contexts and maladaptive in others (Stanisławski, 2019).

When identifying strengths, students without mental health diagnoses reported positive coping behaviours, such as:

> "Making times for my hobbies to look after my mental health"
> "Being able to relatively quickly adjust to the new situation. Still kept in contact with family and friends."
> "Family Self-reflection Mindfulness/Yoga Exercising more"

Students without mental health diagnosis outlined more positive coping which in turn facilitated better mental health outcomes, leading to better adaptation during the lockdown. Whereas, students with mental health diagnoses reported more avoidant coping which is usually associated with poorer mental health (Gurvich et al., 2020). This is unsurprising perhaps as the choice of coping is influenced by personal circumstances and histories.

Social isolation was identified as a difficult by both students with or without mental health diagnoses as these quotes illustrate.

> "Not being able to see family. Not being able to visit my country of origin."
> "Not being able to go to school/college. Having to work remotely. Feeling isolated"
> "Not being able to see my boyfriend for months"

Perhaps it is unsurprising that both groups identified isolation as a main difficulty/challenge during the lockdown, as social distancing and lack of household mixing were core strategies for controlling the spread of the virus.

Only students without pre-existing mental health diagnoses mentioned pressures of academic work and logistics of student life—for example:

> "Working at home full time. Only having online contact with student peers and my supervisors. I've missed the culture and community of my campus."
> "Having to leave my university course prematurely and missing my friends there."
> "Motivation to complete dissertation"
> "Anxiety Degree worries Low mood"
> "Trying to complete my uni assignments when classes were cancelled."

Among students with pre-existing mental health diagnoses, academic struggles were not specifically mentioned, and this could be due to other difficulties taking precedence for them during the lockdown, such as managing their mental health. However, the small sample size limits the conclusion that can be drawn from current data, and this issue warrants further investigation.

DISCUSSION

Isolation has been a commonly reported feature of lockdown (Jia et al., 2020; Kousoulis et al., 2020; Rogowska et al., 2020; Fancourt et al., 2021). With a student community now geographically separated across the UK and abroad, creating a sense of community is an incredibly difficult challenge. Support for and identification of students who feel isolated through an automated check in, could then enable institutions to follow up responses that request this. Institutional logistics determine the practicalities, but the importance of connection has been demonstrated throughout the pandemic. Students' mental health has been deleteriously affected (Hewitt, 2020) and many will need support to succeed in continuing their studies. Vulnerable students are already less likely to succeed (Lawrence et al., 2006), thus supporting their continuation of studies makes this endeavor beneficial for both the student and the institution. Provision and support are likely to be already limited (Macaskill, 2013) and the sector needs to continue to expand both. Facilitating contact and creating opportunities for students to connect with their peers for both academic purposes and socially, go some way to address the issue of isolation which was reported by students in this sample. The University student community has been disrupted significantly, and understanding how this can be addressed by institutions is a starting point for policy and planning. This study identifies some vulnerabilities

and challenges reported by women students. Next steps in policy planning will be determined by budget constrictions, but where there is opportunity this should be made a priority (Universities United Kingdom, 2018).

Our findings suggest that everyone including female higher education students had to make many adjustments during the first lockdown in 2020. It is reasonable to argue that this situation has continued for the remainder of the year to December 31, 2020. Higher education institutions have had to shift to remote delivery and most have done so with varied success (Crawford et al., 2020). Transitions are complicated to navigate at individual and institutional levels (Denovan and Macaskill, 2016). A return to campus teaching may be seen as desirable, but this assumes shared attitudes with regards to risk and the positive nature of in person teaching and study. Flexibility when planning for campus returns, would provide students who have found remote learning positive, with an option to continue without institutional pressure. It should also be considered that familial and financial circumstances may have drastically changed during the pandemic. Bereavements, health issues and unemployment have occurred unexpectedly to many people and disproportionately impacted women (LeanIn, 2020; Power, 2020).

Students are not a homogenous group but there is evidence to suggest that they frequently report similar concerns. The data reported here are from women students the majority of whom are in committed relationships and over a third are also parents. Women students who have children living at home reported finding their role as parent both fulfilling, supportive and challenging. Childcare has consumed more time for many parents in the UK this year following the closure of schools. Characterisation of parenting as a situationally significant factor is justified (Daly et al., 2020) and parental responsibility impacts daily functioning. Flexibility in access to content enables parents to fit their studies around childcare. A (partial) closure of schools in the UK beginning in January 2021 is further evidence that the pandemic's impacts on parents and families is likely continue.

Coping styles for students with pre-existing mental health diagnoses, showed an emerging trend toward more negative coping behaviours and fewer positive coping behaviours. This is supported by trends identified elsewhere; being unable to access usual support systems, affected those with pre-existing mental health diagnoses in the general population throughout 2020 (Jia et al., 2020; Kousoulis et al., 2020; Fancourt et al., 2021). Students with no mental health diagnoses reported more positive coping behaviour and specified details related to positive coping in response to the open question about strengths. Identifying students who are particularly vulnerable will be key to supporting their continuing education. Engagement with university mental health services was reported to be low (20%) by students (National Union of Students, 2020) and such barriers need to be examined and addressed by universities in the future.

Limitations and Strengths

Findings from this study should be interpreted in light of the limitations derived from the small sample size, and the use of newly designed (non-standardised) items to capture participants' (retrospective) reporting of coping and feelings during the lockdown. The key strength of this study is the focus on women students with and without pre-existing mental health diagnoses, which is an under researched group. Nevertheless the sample of women students had a higher prevalence of self-reported diagnosed mental illness (39%) relative to the general population of students (26.6%, Pereira et al., 2020), thus limiting the generalisability of these results. Importantly, this study provided the opportunity to hear first-hand accounts from students about their coping during the lockdown and reflections on personal strengths and challenges. These contribute to a deeper understanding of the impacts of the COVID-19 lockdown.

CONCLUSION

Lockdown required adaptation and appropriate coping strategies to be employed to deal with novel stressors and the "new normal." The risk factors linked to increased psychological distress and less adaptive coping are: being female, a young adult, student, having a pre-existing mental health diagnosis and being a parent, amongst others (Fluharty and Fancourt, 2020; Gurvich et al., 2020; Kousoulis et al., 2020; Niedzwiedz et al., 2020; Fancourt et al., 2021). This report examined a group of female students of various ages, with 39% reporting a pre-existing mental health diagnosis, which is a high prevalence of self-reported diagnosed mental illness relative to the general population of students. Students with a pre-existing mental health diagnosis reported higher levels of loneliness compared to non-students with a pre-existing mental health diagnosis. Students with pre-existing mental health diagnosis reported more avoidant coping and negative emotional coping than students without a diagnosis. Finally, parenting intersects with well-being and stress as both a protective and risk factor.

Further research into vulnerable student groups is needed to understand how this complex picture can be used by HE institutions to provide targeted support and to inform both preventative and targeted interventions. Last but not least: while acknowledging that the disruption for all students throughout 2020 has been significant, it is also important to note that while some students found themselves struggling, others found ways to cope well. Recognising and supporting the steeling effect of coping with adversity is the foundation of building resilience, which may in turn inform preventative interventions.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The College of Business, Psychology and Sport Research Ethics Panel (BPSREP), University of Worcester. The

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Complexities in Student Placements Under COVID-19 Moral and Practical Considerations

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The work placement experiences of MA and BA social work students at an English university during a pandemic were explored by way of an online survey. Thirteen students responded and reported that the moral and practical consequences of a sudden forced move to the "new normal" of online working and assessment raised serious issues about the boundary between home and work life, and about the relationship-based nature of the career they thought they were entering. Experiences of moral and practical support from agencies were mixed, and a lack of consistency across different placement agencies led to feelings of unfairness in the students' experience. Opportunities for incidental and tacit forms of learning were lacking in online working environments and students were strong of the belief that the future of social work would entail a permanent locus shift from community work to online interaction regarding the people (service users and carers) with whom they worked. This shift was largely perceived in terms of loss and a further diminution in relationship-based practice in English social work services, which have increasingly been dominated by a task and performance management culture before the onset of COVID-19.

Keywords: student placements, social work, moral complexity, work – life balance, student support, "new normal", relationship based practice

CONTEXT

Social work training in England has undergone many changes since its beginning in the past century, with its status having been raised to that of a profession requiring degree level entry from 2003 (Department of Health, 2002). The role of employers in determining successful students has increased in recent years, as the curriculum has increasingly emphasized professional capabilities and competencies. In 2020, social work students on 2-year MA courses or 3-year BA courses were obliged to complete a 70-day and a 100-day placement in work agencies as core components to their professional qualifying courses. The 70-day placement is usually in a voluntary agency, whereas the 100-day placement is usually in a state agency where the role, whether in children's or adults' services, is likely to encompass more formal work around issues of risk and vulnerability. In regard to their practice capabilities (British Association of Social Work [BASW], 2018), both MA and BA students are expected to demonstrate the same levels of ability.

LITERATURE REVIEW

A key debate in contemporary social work is whether traditional relationship-based practice (Ruch, 2007) is still at the core of a profession based on values of individuality, respect, and self-determination; or whether the incursion of business values and models into social work has meant that performance management, targets, and budget compliance (Harris and Unwin, 2009), have dominated practice and policy.

Relationship-based ways of working view human behavior as complex and multifaceted, i.e., people are not simply rational beings but have affective – conscious and unconscious – dimensions that enrich but simultaneously complicate human relationships. The professional relationship is seen as an integral component of any professional intervention, with systems compliance a secondary concern (Ruch, 2007). Unwin and Hogg (2012) state that every interaction between social workers, and children and families is unique, and that being able to explore issues in depth from a relationship-based platform can produce insights that effectively help challenge power imbalances and structural oppression. A relationship-based approach is seen as enabling practitioners to work in depth and move away from any reductionist view of children and families.

Social work student placements have traditionally offered "real world" learning environments which are quite different from the more theoretical orientation of the classroom, albeit students are expected to use placements to understand the fit between theory and practice. Prior to the COVID-19 lockdown and its associated move to online working, students have always been able to benefit from this "opportunistic, unplanned, and often serendipitous" way of learning (Hyams and Sadique, 2014, p. 440); Marsick and Watkins (2001) also emphasized the importance of everyday interactions and incidental learning with peers and supervisors. Similarly, Kloppenburg et al. (2018) advised that learning through exposure to academic and professional communities remains crucial for social work education, acknowledging that "the reduction of participation in this community inevitably leads to an erosion of the learning environment for social work students" (p. 16). The opportunities for tacit learning, situated within everyday social encounters and interactions with co-workers (LeClus, 2011), were significantly reduced for students during the pandemic. Bethere et al. (2014) emphasized that positive relationships with students represent a key precondition for the achievement of positive learning outcomes, whereas Phelan (2015) placed great importance on "the interplay of people" (p. 529) in providing students with the opportunity to learn from role models and be exposed to the mores of professional socialization. Moreover, Lave and Wenger (1991) stressed the impact that being part of a community of practice has not only on learning, but also on the construction of professional identity and status, a point subsequently emphasized by Webb (2017).

The New Right's introduction of business models into social work and other public services can be seen as having eroded much of the discretion in professionals' roles, in that it introduced managerialist approaches to performance management, rather than trusting professionals to make decisions on

risk, relationship, and resource utilization (Harris, 1999). Faith was traditionally placed in professionals as guarantors of the performance of welfare-state services, including social work. This traditional culture compares starkly with performance management cultures which are characterized primarily by quantitative measures of control (league tables/targets/budgetary compliance), rather than being concerned with qualitative and relationship-based issues. The risk to social work under performance management regimes is that practitioners can lose sight of why they are in their professions and can marginalize their service users and carers as units on a spreadsheet, or costs to be cut (Harris and Unwin, 2009). This risk of commodification increased with the onset of the 2020 pandemic, which brought a significant lessening of face-to-face contact with social workers.

When the World Health Organization [WHO] (2020) declared COVID-19 as a global pandemic in March 2020, people across the world started to experience a "new normal" (Atuel et al., 2020) in relation to their whole lifestyles encompassing personal relationships, work, and studies. Following WHO's advice that all countries should take urgent and aggressive action, the United Kingdom government implemented a strict plan for protecting public health including imposing a national lockdown at the end of March 2020. All aspects of public life were radically affected, including the closure of schools and universities.

The sudden change in both study and working environments under COVID-19 set university students on a rapid learning trajectory, especially with regard to IT systems of communication. Social work students on work placements received confusing, and at times, conflicting messages, about their status as the key or critical workers. Such confusion echoed national mixed messages, and both academic and workplace tutors alike strove to interpret such guidance in the interests of their students' career futures, while prioritizing issues of health and safety. This guidance continues to change at the time of writing, but essentially, social work students became classed as key workers, equipped with personal protective equipment and privy to a range of protocols about safe working. The student environment changed overnight – no longer were they in offices with supervisors and fellow students on a day-to-day basis, and neither were they receiving face-to-face support from academic tutors. Their world became primarily an online world. Furthermore, the fact that some 90% of social work students are female meant many had childcare or other caring responsibilities (Amadasun, 2020). Significant numbers of students are in 'digital poverty' and cannot afford the quality information technology (IT) equipment necessary to work professionally from home, even if they have the space and privacy (Office for Students, 2020). This same study found that 52% of students believed their learning was impacted by poor internet connections, and 71% reported a lack of any private space at home in which to work. The confidential, and sometimes distressing, nature of social work placements made such environments even more challenging. The scope for blurring boundaries and incurring the moral injury (Litz et al., 2009) of bringing issues of abuse and neglect into their own homes *via* video conferencing and calls, constituted a scale and form of challenge that students had not

expected to encounter when they originally signed up for their social work course.

Women, in general, seem to have borne the brunt of COVID-19, an Office for National Statistics (2020) study having found that 67% of women, compared to 52% of men, took the responsibility of home education for children. Many social work students are in part-time employment alongside their studies, the loss of such employment during the pandemic causing further difficulties according to the Trades Union Congress (2020). Ninety percent of working mothers interviewed in this latter study reported that the financial and childcare/education responsibilities had negatively impacted their physical and mental health. Students who could not afford to take a break from their studies had little choice but to work long hours and fit in their studies around domestic responsibilities.

In tandem with the above work placement changes encountered, the academic environment also changed rapidly, both for students and staff. Traditional classroom-based teaching moved largely to online delivery, comprising a mixture of synchronous and asynchronous learning, delivered via a variety of learning platforms (Jonge et al., 2020). At the University of Worcester, the virtual learning environment strived to recreate and replace class delivery. Social work student feedback regarding such changes was mixed, but largely appreciative of adaptations brought into play to prevent disruption of studies. A national study by the Office for Students (2020) found that 51% of students said they were satisfied with the quality of their teaching during the pandemic, compared with 34% who were dissatisfied. Students who reported having live online lectures tended to view their teaching more positively than those taught via recorded lectures or slides.

At the beginning of the pandemic, all social work placements were suspended by Social Work England (SWE), the professional regulator for social work, as students were not initially seen as key essential workers. Subsequently, SWE initiated an open dialogue with universities in an effort to design realistic strategies for recreating placement around the social distancing rules. The University of Worcester was part of this dialogue, aiming to offer students from both of its BA and MA programs the opportunity to complete their placements as seamlessly as possible in terms of learning objectives, assessment, and direct work opportunities. Broadhurst and Mason's (2020) insistence that face-to-face working and co-presence continued wherever possible, informed the university's endeavors in rising to this challenge. Students, academic staff, practice educators, and university placement teams all found themselves caught up in Chang's (2010) construct of compressed modernity – an accelerated and complicated process of deconstructing, constructing, and then rapidly reconstructing structures and strategies. Amadasun (2020) held the view that the pandemic's enforced move to online working, and the lessening of certain practice standards by the government, had undermined and overturned key values of social work.

The above fascinating, but unforeseen, set of circumstances led the authors to become interested in studying the effects of the "new normal" on their students in placement and the research proposal below was formulated.

AIM AND OBJECTIVES

The research project aimed to explore how the "new normal" of teaching and assessment practices affected students on their professional qualifying courses, particularly in regard to work placements.

The key objectives were:

► to identify and explore the challenges affecting student social workers practice placements in the COVID-19 context,
► to identify and explore the challenges affecting student social workers' personal/family life and well-being in the COVID-19 context, and
► to establish whether any aspects emerging from this particular context were likely to impact students' future social work practice/career intentions.

METHODOLOGY

The study took place during November and December 2020, during England's pandemic period, which had included periods of lockdown. The associated prohibition of non-essential personal contact meant that methodologies comprising focus groups, observations, or face-to-face interviews were not feasible, and it was also appreciated that social work students carried heavy workloads, both academic and practice. Therefore, an online survey was devised as a means of eliciting perspectives about working on placement in times of pandemic. The e-survey appeared to be the best way of reaching students on placement, was inexpensive, and offered a form of data collection which was flexible and time efficient (Braun et al., 2020). Sending the e-survey link to students provided them the opportunity to complete the survey at their convenience, with no immediate pressure, and an opportunity to share perspectives confidentially and anonymously. However, the limitations of an e-survey are acknowledged as a non-discursive form of participation. Considering the qualitative nature of this study, it would have been ideal to establish direct contact with the respondents, in order to capture non-verbal interactions and the subtleties of discussions around sensitive personal topics. The anonymous online survey consisted of five questions, providing participants with free text boxes to expand any answers. The core questions were:

► How has your learning been impacted by working remotely during the practice placement?
► How has working from home during placement impacted your personal life?
► How has the COVID-19 pandemic impacted your academic attainment during the practice placement?

▶ How has the COVID-19 pandemic impacted your opportunities to develop specific social work skills and knowledge in placement?

▶ In your opinion, which aspect(s) of social work organizations' culture and practices, in relation to student placements, do you think will change after COVID-19?

Ethical approval was granted by the University of Worcester Allied Health and Community Ethics Panel (Ref-CHLES20210004-R), and the survey was administered by the authors via "e-survey creator" to final year BA and MA social work students in November 2020, remaining open for a month. A central link meant that no student identification other than participant number was identifiable.

The main difficulty encountered by the researchers was in engaging students to complete the survey. Although the link was sent to 45 students, only 13 respondents had completed the survey at the point of survey closure. This was despite two reminders having been sent, the authors (both also academic tutors to the students) being concerned not to be overly demanding for fear of skewing the research. Students may have perceived power dynamics at play, possibly with consequences for non-participation, even when the survey was presented as anonymous in nature.

Survey respondent fatigue (Porter et al., 2004) was identified as the probable reason for not having received a higher response rate. From the start of the pandemic, social work professionals and students were frequently asked to be part of various exploratory projects by professional and regulatory organizations, such as the British Association of Social Workers and SWE, their employers, and academic staff. Hence, many students may have felt respondent fatigue and afforded little priority to a staff research project.

The findings discussed below were arrived at via thematic analysis (Braun and Clarke, 2006; Nowell et al., 2017) of the survey responses. The authors read and reread the survey responses individually, coded them line by line, and subsequently developed overarching themes which were compared and refined as appropriate to produce the following themes: the diverse impacts of remote working on student learning during placement, conflictions between personal and professional worlds, effects of a lack of face-to-face interaction on professional development, opportunities, and challenges in skill development, and post-COVID-19 predictions regarding "virtual" social work. The contents of these themes are discussed below.

DISCUSSION OF FINDINGS

The Diverse Impacts of Remote Working on Student Learning During Placement

Student experience in relation to remote working was diverse, being mainly determined by the degree of support received from their placement provider. In particular, respondents reported encountering difficulties in relation to using the specific data systems used by various placement providers.

One respondent reported: "When working from home, no IT support and guidance around how the data system works is provided in person, the assistance over the phone is not efficient; mistakes are made and they make you feel lousy." It was very difficult to build the knowledge and skills related to this key component of working, with another student expressing their insecurities in regard to this aspect: "I was not sure what I was doing, I was trying hard to get used to using the electronic systems at home without support. My workplace supervisor was very busy, so I was unclear most of the time about what I should be doing."

However, other students had a positive experience, reporting that: "The placement provider offered additional support and training... which was invaluable" and "The support system was great." Additionally, one respondent felt "It was challenging, but I managed to do it on my own, although slowly, which gave me confidence in my ability to adapt."

Respondents acknowledged that working from home was the biggest challenge: "...not being in the office environment took away the opportunity to listen and learn from other social workers." Informal and incidental learning, an important source of knowledge for students (Marsick and Watkins, 2001), was diminished or non-existent due to the lack of contact with the teams and not working in an office environment or shadowing professionals. Others recognized the limited opportunities for such informal and incidental ways of working: "I had not enough opportunities to shadow social workers, which I needed in order to learn," "I have not been able to learn from others, ask questions, or observe other professionals," and "I had less opportunities to get support from colleagues in the team." Another student concluded that "The main impact was on amount and quality of time I was able to spend with qualified social workers, learn from them, and develop my own style. leading to less chances to gain the knowledge otherwise assumed." The above quotes demonstrate that students could not make use of the opportunistic and serendipitous ways of learning seen as so important by Hyams and Sadique (2014), and they also missed out on the essential daily interactions with peers and supervisors (Marsick and Watkins, 2001). Similarly, Kloppenburg et al. (2018) advised that learning through exposure to academic and professional communities remains crucial for social work education, acknowledging that "the reduction of participation in this community inevitably leads to an erosion of the learning environment for social work students" (p. 16). The opportunities for tacit learning, situated within social encounters and serendipitous interactions with co-workers (LeClus, 2011), were significantly diminished.

Contact with other students completing their placement within the same organization was also recognized as an important source of support. Unfortunately, this form of support was not available for students during remote working, with one respondent having recognized that: "Working remotely made it challenging to feel connected to other students," while another reported that: "I felt isolated, couldn't share my experience with anybody."

Another challenge identified by students was related to the difficulties in relating to the emphasis placed on ethical ways

of working (Banks, 2016; British Association of Social Work [BASW], 2018) in their classroom teaching, to the realities of pandemic-enforced ways of working. Students completing their placement remotely felt they were not promoting the key ethical principles of social work, citing their inability to connect to service users and carers face-to-face, building appropriate rapport, and delivering relationship-based practice: "There were no more face-to-face assessments; assessments were done *via* telephone, therefore, not directly seeing service users. You can't fully reach individual needs this way." Another respondent concluded: "I was unable to get a true picture of service users' situations – this impacted on the quality of service provided to them." The same barrier was recognized by other respondents who acknowledged that remote placements were offering ". . .less opportunities to engage with service users," which made building rapport with service users and carers difficult, combined with the fact that: "Communication and assessment over the phone hindered the relationship between social workers and service users." Another respondent observed that: "Service users' limited access to technology made me unsure if the information gained is accurate or not." All the above observations echoed the ethical challenges encountered by social workers around the world in relation to their daily practice under the pandemic, as reported by Truell and Crompton (2020).

However, some students perceived the remote placements as a positive challenge, demonstrating they were in possession of key practice elements, such as the ability to improvise, flexibility, and endure, which McFadden et al. (2020) stated were important protective factors that facilitate resilience in the social work educational field. For example, one respondent recognized that: "I learned a lot about different ways of working and it has made me more flexible," and another considered remote working as an opportunity for: ". . .getting better in using virtual technology, getting more used to it, finding ways in which we can connect more efficiently" and "ultimately gaining confidence and having the feeling you can achieve the goal of qualifying, no matter what."

Conflictions Between Personal and Professional Worlds

As Banks et al. (2020) noted, social workers have had to handle significant extra pressure during the pandemic due to remote working, as the line between their work and personal work was "blurred" (p. 17). This dilemma was reported by students completing the survey – they also felt this pressure, leading sometimes to an inability to draw a clear line between professional practice and personal life. One of the respondents found that: "It was difficult to separate work from personal life, because they blend into each other when working from home, where it can feel like you are always available."

Other respondents reflected on missing the opportunities for reflection and decompression offered by commuting back and forth to work, with one respondent experiencing difficulties in: ". . .switching off when finishing work, because there was no journey to reflect and separate the two." This led to a very thin, almost non-existent, line between professional and personal

spaces, with one respondent describing that: "I finish work, leave one room, and then I'm a mum, cooking tea and doing homework with my children."

Attending to their parenting responsibilities at home and using the same space for work brought in logistical difficulties as well. Several students reported the lack of an appropriate workspace; the fact they had to buy new furniture to improvise an office arrangement in their home, and also working in family spaces, made it very difficult to promote and maintain some key aspects related to the ethical and confidential conduct of social work. Respondents found it difficult to maintain confidentiality when working at home and having family around, especially those who had to work in a shared space, such as a kitchen or a living room. With children being homeschooled for most of the time during the pandemic, students, especially females, have had to undertake a double role, mostly within the same time framework, as both student in placement and parent *in situ*. This multifaceted role put additional pressure on them, affecting the quality of their learning and making one respondent feel that: "I was not doing anything as I should have, not in placement or as a mom," or causing them to feel they are failing in both areas: "My daughter wanted to play with me; she didn't understand why I was at home but didn't have time for her. I was stressed because of my work, didn't have patience to deal with her, then I felt a bad parent because I was keep sending her away."

Conversely, several responses produced evidence of positive impacts brought to students' personal lives by remote working. Time saved on commuting, for example, freed up time for other tasks and roles. Some students reported that they "saved time, which was spent on self-care instead," or in supporting their children with the school run – "after a long time, I was happy I could take my son to school and pick him up in the afternoon." Childcare provisions (pre- and after-school) were less available during the pandemic, and there was often confusion about whether such providers should view students as key workers. However, some respondents welcomed the fact that they were spending less money on childcare facilities now that they were able to work from home.

The Effects of a Lack of Face-to-Face Interaction on Professional Development

Despite students having rapidly developed new key skills of communication in practice, the virtual nature of their work placements was considered a significant factor hindering their academic attainment.

Strong views were expressed regarding the virtual recall days back at university – days designed during placement to enable students to summarize the key knowledge and skills achieved in practice, as well as to reflect on their journey in placement. Most importantly, such days offer the opportunity to reunite with peers and create a strong sense of togetherness and belonging to a community of practice (Lave and Wenger, 1991), as well as a strategy for empowerment and support to continue their learning journey. As a mandatory component of their practice modules, students usually attend these recall events on the university campus. However, due to the specific restrictions in place, recall

days were delivered virtually during the period of this present research study. The feedback received from respondents in the survey clearly reflected that organizing the recall days virtually led to a loss of these events' meaning, diminishing the power of peer support, a form of support seen as critical by Graham and Rutherford (2016).

One respondent felt that: "Virtual recall days didn't give me the sense of being in the same boat," which was confirmed by another one's opinion: "virtual recall days were not reassuring and motivating as they would have been face-to-face – they don't give you the chance to have an easy chat." In addition, there are some specific comments related to the effectiveness of these activities when delivered online: "there were no natural discussions in virtual recall days," "I lose concentration very quickly in virtual environments," or "virtual recall days don't offer you the dedicated learning time, space and mind-set; we can't learn from each other." Another respondent concluded that: "I need to have face-to-face activities at university – this is what we have signed up for."

Some respondents, however, were more focused on the practical side of things, acknowledging that completing the recall days virtually gave them the opportunity to save time and resources: "It is much easier to have the recall day virtually, we don't need to travel, we save time and money."

OPPORTUNITIES AND CHALLENGES IN SKILL DEVELOPMENT

Remote working also affected students' opportunities to develop key professional skills, e.g., observation, assessment, and presentation. Respondents reported that completing their direct observations of practice when they are observed by their workplace supervisor (a key element of their practice placements) was challenging, due to the virtual nature of the placements:

- ▶ "Because I was not able to visit the service users in their environment, my observation skills were negatively impacted,"
- ▶ "I was observed delivering a presentation on Zoom – I couldn't see my audience, hence my presentation ability was impacted," and
- ▶ "Service users do not like virtual meetings; therefore, it was very difficult to get an agreement from a service user to be part of my virtual direct observation."

The answers above clearly acknowledged the challenge of creating a meaningful relationship with service users in a virtual environment, recognizing that technology, although beneficial in general, has also impacted negatively on social work practice (Heslop and Meredith, 2018).

However, some of the respondents also perceived such challenge as an opportunity to "push" themselves outside their comfort zone, and become creative, flexible, and resilient: "We are learning to work with limited resources, using online and social media, we are learning in crisis. There are all valuable skills to take with us in our future careers." Another respondent recognized that: "I did develop skills in virtual working and being more flexible in practice."

The above reflections resonate with Ruch's (2007) contention that challenges, uncertainties, and mistakes could also be considered as turning points and learning opportunities for practitioners in social work.

POST-COVID-19 PREDICTIONS REGARDING "VIRTUAL" SOCIAL WORK

As a conclusion to their surveys, respondents detailed their opinions in relation to the elements of practice placements they anticipated were likely to become permanent post-COVID-19.

The core view from respondents was that virtual contact would become a significant part of social work practice, both in relation to working with service users, as well as with teams, with consequences for professional standards and relationship-based practice (Truell, 2020). This position is summarized by the following respondent: "Face-to-face social work will be reduced post-COVID. This will have a serious impact on relationship-based and person-centered social work."

Respondents envisaged that they would experience virtual supervision and placement meetings in the future, and that workplace induction and training will stay online. One respondent posed the question: "How you can become part of the system, when you are isolated by the other components of it?" Although respondents accepted that virtual practice would become a substantial component of professional practice, they called on academics and practitioners to remain aware of the importance of direct work with service users and carers, as well as the benefits of direct contact with teams in office environments. One respondent articulated: "I am clear that we will continue to use virtual technology, but I hope that it will be recognized that a student cannot learn good or bad practice without observing [service users and carers] live." Respondents largely hoped that, in their efforts to blend remote and direct ways of working, both universities and placements will think more creatively about how students can meaningfully meet placement requirements for authentic relationship-based ways of working, and not just become computer operators who are technically efficient at form-filling and reaching performance management targets. There was general agreement that this was not the form of career students had signed up to follow. One positive note from a respondent was concerned about the role students had managed to play during the pandemic, often providing a much-needed extra pair of hands when staff were off sick. This respondent's view being that in future crises, "placements will become more reliant on students, as they became more independent, and showed they can work without so much support when working from home."

CONCLUSION

Organizing social work practice placements during the COVID-19 pandemic proved to be a particularly challenging experience for universities and employers who provided placements for participating students. Ensuring that social work teams were safe and practiced ethically during these unprecedented times of pandemic was clearly difficult, and the integration of students within this environment led to many dilemmas, made worse by

ever-changing government directives. Student participants in the above research gave mixed views about their experiences, many appreciating the opportunity to continue their chosen career path, despite the radically changed workplace environment, while others felt disadvantaged by the continued expectations that placements should continue. The latter group of students found that online working militated against the types of relationship-based ways of practice they had envisaged in the field, whereas others accepted this diminution in personal contact, and looked to the new skills they had developed in a virtual environment. Such findings can be located within key literature such as Kloppenburg et al. (2018) who advised that learning through exposure to academic and professional communities remains. Tacit skills (LeClus, 2011) might also be learnt via online interaction, but the incidental learning and serendipitous encounters where informal knowledge might be exchanged are absent in such forums. Informal interplay of people (Bethere et al., 2014) are also absent in the formal signing in and out of online interactions and professional socialization (Phelan, 2015) is very limited.

It is indeed to the credit of all that placements continued, and the University of Worcester has not reported any cases of COVID-19 having been contracted by students while on placements, which have been managed more safely since personal protective equipment and clear working protocols were established. Accommodations have been made by both universities and workplaces regarding flexible hand-in dates of assignments and offering greater flexibility in placement hours for students; this latter provision being particularly valued by student-parents.

The ethical costs of "keeping the show on the road" for the service users and carers at the receiving end of services is not known, although some respondents suggested that theirs was a lessened experience, especially when unable to communicate face to face. It would appear that social work's move to a performance management model (Harris and Unwin, 2009) has not been halted by the pandemic; indeed, the efficiency of online ways of working in keeping systems going has been hailed as a success which, although technically accurate, has not included students feeling part of the community of practice as identified by Lave and Wenger (1991). Student opportunities to achieve Webb's (2017) professional identity and status have also been hampered by an online environment which does not lend itself to the development of close working relationships, which are often cemented in professional circles by informal and serendipitous interactions.

The cost to future generations of social workers may be that they do not stay in a profession which is based on virtual ways of working. Most students believed that the legacy of the pandemic will mean continued reliance on as many virtual platforms

as possible, especially in the cash crisis likely to impact local authorities (Government) post-pandemic.

Valuable lessons have been learned during the pandemic by universities and placement providers, as reflected in the above findings. Regular online sessions for students, as well as online recall days while in placement, received mixed praise from student participants, while the importance of direct support within their respective teams, and the value ascribed to incidental learning in the workplace was highlighted as critical to personal and professional development. Work placement environments which allow for such informal spheres of interaction should form part of the new practice models which will emerge post-pandemic. It is recommended that customized assessment and support systems for newly qualified social workers should be put in place to ensure that any gaps in learning accumulated during pandemic student placements are addressed. Additionally, universities must continue to find safe ways of developing and maintaining a sense of collegiality among students who lamented the loss of such support when most academic learning went online.

In conclusion, although Amadasun (2020) noted that the pandemic had somehow undermined and overturned key values of social work practice, positive insights can be taken from the student testimonies in the above research. These testimonies resonate with Broadhurst and Mason's (2020) views that the value of face-to-face interactions and the power of co-presence remain ever critical for the social work profession, whatever challenges the post-pandemic world will present.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the University of Worcester Ethics Panel. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

RS and PU completed the writing of this research study. Both authors contributed to the article and approved the submitted version.

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The Impact of the COVID-19 Pandemic on Women Working in Higher Education

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INTRODUCTION

In response to the COVID-19 pandemic in March 2020 many organisations, including universities, requested employees to work remotely. Subsequently the education sector saw a rapid move away from classroom-based pedagogies towards distance learning (Aldossari and Chaudhry, 2021). It has been recognised that the impact of the COVID-19 pandemic on men and women is different (Yildirim and Eslen-Ziya, 2020). This is no different in Higher Education. With the closure of schools and pre-schools, women with children were faced with a sudden increase in childcare responsibilities and household labour (Yildirim and Eslen-Ziya, 2020). Domestic roles and responsibilities appear to become less defined, the boundary between home and work became increasingly blurred (Alon et al., 2020; Cui et al., 2020; Yildirim and Eslen-Ziya, 2020). Household living spaces were transformed into places of learning, childcare and work (Clark et al., 2020). There are indications that divisions widened during the COVID-19 pandemic (Guatimosim, 2020; Minello, 2020).

Women already faced with the burden of educating children coupled with their own employment, saw a sudden increase of childcare responsibilities and household labour forced by the lockdown. This created work/family conflict and was more apparent to women (Alon et al., 2020; Biroli et al., 2020; Carlson et al., 2020; Costoya et al., 2020; Power, 2020). This is likely to have led to a decrease in engagement with paid employment, necessitating that women increase their overall workloads to meet these emerging demands (Wang and Inoue, 2020; Yildirim and Eslen-Ziya, 2020). Gender inequality within the household is not a new concept; it is often noted as being two-fold, historically known as the double burden (Hochschild and Machung, 2012). Research indicates that having children is an important precursor to changes in workload (Yildirim and Eslen-Ziya, 2020). The impact is wide-reaching, leading to a decrease in psychological wellbeing and health difficulties, as well as limiting career development and progression (Blau and DeVaro, 2007; Yildirim and Eslen-Ziya, 2020). The following will explore whether or not the advent of COVID-19 pandemic and the resultant changes to working practices have exacerbated these existing gender inequalities.

ROLES AND RESPONSIBILITIES

There are well documented and researched inequalities between men and women in the workplace which existed long before the COVID-19 pandemic (Yildirim and Eslen-Ziya, 2020). These inequalities stem in part from women's role as mother and provider of childcare, and also through idealised societal norms such as those associated with appearance. Women are more likely than men to take career breaks associated with childcare, this places them at a double bind. They may fall behind their peers in what remains traditional linear career progression models and also have to take time in personal and professional development in order to recover lost ground (Blau

and DeVaro, 2007). Women are then more likely to return to work in part-time roles which may necessitate taking a backwards step into their careers (Blau and DeVaro, 2007). Hochschild (2012) argues that there is a division of labour associated with 'men's' and 'women's' work, with women undertaking 'caring' or 'nurturing' work and men undertaking roles which require a colder emotional approach. In addition, women are more likely to be subject to direct or indirect discrimination in their working lives (Peterson and Morgan, 1995).

The expectations of motherhood play an important role, requiring women to conform (Nilson, 2015; Güney-Frahm, 2020). Such an idealised image begins during pregnancy and continues post-birth, encompassing the caring role, healthy role and working role. A possible impact of the COVID-19 pandemic is that the combination of these roles is unattainable as a result of social isolation (Güney-Frahm, 2020). The onset of the COVID-19 pandemic has acted to exacerbate the disparity between genders by putting pressure on women to achieve unattainable socio-economic goals (Güney-Frahm, 2020). In the context of Higher Education having to meet these expectations could lead to an increased sense of failure, whether perceived or actual. These neoliberalist views of motherhood roles act to increase inequalities (Wang and Inoue, 2020; Yildirim and Eslen-Ziya, 2020).

Research notes that the COVID-19 pandemic led to an increase in women as the main care provider alongside and to some extent created by working from home as an employee (Wang and Inoue, 2020). This included women as the main provider of childcare, including the provision of home-schooling in real-time adding to the burden. Women primarily undertake domestic chores, such as cooking and cleaning, tasks which are more intense during the lockdown period due to increased occupancy in the home (Aldossari and Chaudhry, 2021). The COVID-19 pandemic has accelerated change in working practices such that the volume of work rapidly increasing. In Higher Education for example, teaching and learning activities had to be taken rapidly online, which required additional training to learn the use of new technologies relevant to remote teaching. In addition, teaching pedagogies also had to be adapted to facilitate remote learning which also contributed to the volume of work rapidly increasing.

Research conducted by Yildirim and Eslen-Ziya (2020) demonstrated that the day-to-day routine of female academics with children was disproportionately affected by the COVID-19 pandemic. In addition, women with children are academically less productive than men (Collins et al., 2020; Lutter and Schröder, 2020). This could relate to the conflict between the demands of both roles, where women must prioritise childcare. In family units with children, where the man is the main financial provider, the women is expected to undertake additional roles that the man cannot. Arguably, the COVID-19 pandemic has required an increase in the need for 'caring' work which Hochschild argues is more likely to be undertaken by women (2012). This may have placed an additional burden, as this work is allocated or delegated disproportionately to female members of staff (Hochschild, 2012). COVID-19 has been at the top of Higher Education agendas for the last 12 months. Although there are

established policies promoting gender equality, these have been deprioritised. This may not have been a conscious decision but time, energy and resources have been diverted (Yildirim and Eslen-Ziya, 2020).

Development Activities and Career Progression

Where boundaries between home and work are blurred women may feel greater levels of stress and workplace burnout (Clark et al., 2020). In addition, to domestic tasks, stress can also originate in the workplace, through for example direct or indirect discrimination or lack of opportunity to gain promotion (Doyle and Hind, 1998; Knights and Richards, 2003). To mitigate this woman may move into less demanding roles or reduce hours at work (Connolly and Gregory, 2008; Wheatley, 2013). Higher Education has taken steps to support employees during the COVID-19 pandemic, including putting in place remote working arrangements (Nash and Churchill, 2020). Nash and Churchills (2020) research conducted in Australia, showed that whilst flexible working arrangements were often in place, these were not necessarily consistently applied. The impact could be a view that caring responsibilities are exceptional rather than the norm. An unintended consequence is that caring responsibilities become hidden, overlooked and thus not deemed institutional priorities (Acker, 2006).

Working mothers were reported to work an increasing number of hours in order to meet the demands of childcare and the workplace during the lockdown phase of the COVID-19 pandemic (Jessen and Waights, 2020). This could suggest there is limited time for additional activities such as those required for career development, as the focus is on what is perceived as essential or core tasks. Andersen et al. (2020) research denoted that the research activities between men and women differed. For example, they reported that 19% fewer women were named as first author when compared to the same time in the previous year. In addition, Kitchener (2020) and Viglione (2020) presented anecdotal evidence suggesting women submitted fewer papers to peer-reviewed journals, compared to men.

Aldossari and Chaudhry (2021) noted the difference in how men and women see the transformed spaces; where men see home as a restorative place whereas women see it as a place of unpaid work, which may have led to feelings of inadequacy and burnout. Inappropriate or unsuitable spaces to conduct work, or having to work unsociable hours when children are asleep has added to the burden (Clark et al., 2020; Nash and Churchill, 2020). The COVID-19 pandemic has arguably led to women losing resources available to them and subsequently increasing vulnerability to further losses, when compared to men (Peck 2020). These losses could be in relation to loss of earnings, or loss of a job and highlights a resource poor position women held, relative to men, prior to the COVID-19 pandemic (Connolly and Gregory, 2008; Wheatley, 2013). Academic productivity is measured in part by the number of peer reviewed submissions. This found a reduction in women submitting publications, whereas men remained unaffected by the COVID-19 pandemic (Anderson et al., 2020; Collins et al., 2020; Lutter

and Schröder, 2020). Productivity also encompasses aspects of teaching and learning, which women may have conducted at unsociable times to reduce interruptions (Jessen and Waights, 2020). Similar gender gaps were noted in broader populations, indicating the COVID-19 pandemic has far reaching implications for women in the workplace (Collins et al., 2020).

DISCUSSION

This paper explores the impact of the COVID-19 pandemic on women working in academia, in particular the disproportionate care burden of women resulting from the dispersed and isolated family unit (Jessen and Waights, 2020). Research has highlighted how the reality of working at home has disproportionally impacted women with children. Quite simply, there is more childcare to do, occupied houses require more cleaning and meal preparation that cannot be completed by anyone else. The gender gap has widened with these competing demands (Alon et al., 2020; Biroli et al., 2020; Carlson et al., 2020; Costoya et al., 2020; Power, 2020). The expectations of these roles and the constraints surrounding them, including who should perform them, may change the construct of motherhood (Güney-Frahm, 2020). As a result women have had to prioritise motherhood in order to fulfil an idealised role (Collins et al., 2020; Lutter and Schröder, 2020). This is likely to lead to a reduction in productivity in their paid role and close career pathways. A consequence may be a reversal of the progress in gender equality agendas in Higher Education (Yildirim and Eslen-Ziya, 2020). Disruption to the boundaries between work and home are likely to continue in the short to medium term.

Therefore, moving forward Higher Education employers must consider the impact of the COVID-19 pandemic on women with childcare responsibilities (Nash and Churchill, 2020). Higher Education employers must ensure maximum flexibility for staff in terms of when and how work is undertaken. This may help women to restructure the time when work is undertaken and allow that to be weaved in between childcare tasks. Given that this paper concludes that the overall workload of women has increased, they must be able to contribute by working outside of traditional working hours and locations, with all of the associated patriarchal connotations. In their internal communication strategies Higher Education employers should strive to create a culture where nonstandard working hours and locations are accepted, embracing new ways of working. This should perpetuate cultural change away from the traditional concept of working hours which by its nature disadvantages women who are having to provide childcare. More work is needed in this area to ensure that initiatives, whilst well intended, deliver. Higher Education employers should undertake equality impact assessments both prior to and importantly after such initiatives are put in place.

FIGURE 1 | Three key factors that led to a disproportionate impact on women working in academia, relative to men.
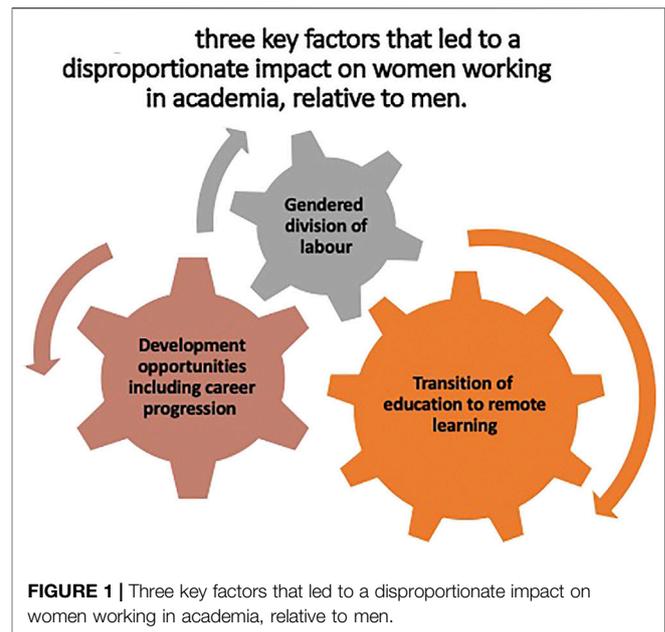
This paper has explored three key factors that led to a disproportionate impact on women working in academia, relative to men. These three key factors focus on the roles and responsibilities of the transition of education to remote learning, development opportunities, including career progression and the gendered division of labour, including caring responsibilities (see **Figure 1**). The findings indicate the gender gap in the context of domestic tasks and factors that may influence career development. Further research is required into the long-term consequences of the COVID-19 pandemic on women working in higher education. This is limited to a comparison of men and women, pre and post COVID-19, further work should be carried out to understand the effect on other groups and importantly, intersectionality. This work should for example aim to understand the impact on single sex or trans parents. Further work also needs to be carried out to understand the level of disadvantage that motherhood places within Higher Education relative to other groups.

AUTHOR CONTRIBUTIONS

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Musical Practice in Music Students During COVID-19 Lockdown

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The pandemic situation has forced students in higher education to use alternative learning routines due to reduced activities at universities and educational facilities. Especially music students needed to adapt their musical learning to this particular situation. Mostly affected by the lockdown was the musical practicing behavior, especially when practicing at the University of Music was not possible. In this study, music students in their second and third semesters were asked to provide information on their practicing situations during the coronavirus disease 2019 (COVID-19) lockdown. They were required to fill in questionnaires about the practicing time and concepts of self-efficacy and self-regulation for musical learning. The data of 18 music students were collected. For the analysis, they were compared with the answers of 15 music students who were asked the same questions half a year earlier before the pandemic situation occurred. The results showed that the music students relocated mostly to their parents' homes for practicing during the lockdown. In the amount of practicing, the bachelor of music students practiced less during lockdown compared with before the lockdown. The mean self-efficacy for musical learning did not differ between before and during the lockdown. For the self-regulated musical learning, the music students showed significantly higher values in the subscale on reflecting and creating a framework for the progress of musical learning during the lockdown. The findings indicate that the music students developed certain self-regulated learning skills during the lockdown and managed to find suitable solutions in continuing with their musical learning without reservation.

Keywords: formal practicing, self-efficacy, self-regulation, practice strategy, music students

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic resulted in severe restrictions during the summer semester 2020. In Germany, the government imposed certain requirements and regulations to prevent further spread of the coronavirus, the so-called lockdown. A necessary provision was to urge universities to cancel all live courses and events and to change to digital online teaching. For the students, this entailed no seminars and lectures with physical attendance, and they had to work at home. The teachers started to use formats of asynchronous learning, where the students had been given a task they could perform at their own pace until a certain deadline, or synchronous learning, where both students and teachers attended live online meetings.

Thus, the students had to schedule their time more autonomously. An evaluation study with German students at universities showed that only a small amount of classes has been completely omitted and that the students managed the semester rather well with some constraints such as technical problems or individual stress experiences (Lörz et al., 2020). However, no evaluation has been made with music students addressing their specific study situation so far.

At the University of Music, the lockdown restrictions resulted additionally in the cancelation of orchestra, ensemble, and choir rehearsals and concerts. For music students, this is a rather large part of the curriculum. But most importantly, the individual instrumental and vocal lessons were affected, which are commonly taught in a one-on-one situation with teacher and student. For that, individual solutions for online teaching and asynchronous learning were found. Furthermore, the most essential learning activity of music students is practicing. During the lockdown, practicing was not allowed at the University of Music, and the music students needed to find other arrangements for musical learning than usually exist in a typical semester.

Music students devote tremendous amounts of time and energy to practice (Jørgensen and Hallam, 2016). It is driven by the understanding that practicing is the basis to attain technical and musical proficiency necessary to pursue a professional music career (Evans and Bonneville-Roussy, 2016). One of the main principles in achieving expertise is the concept of deliberate practice, which is described as practice activity following specific goals and self-monitored achievements (Ericsson et al., 1993; Lehmann and Ericsson, 1997).

The theoretical framework of Ericsson et al. (1993) postulates a close relationship between the amount of deliberate practice and individual level of expertise, indicating a high correlation between musical achievement and the time spent practicing in highly professional musicians. This finding, however, may suggest that musical achievement is more likely the result of one's efforts and quantity of time spent for practicing than of talents or gifts (Miksza, in press). Studies showed that practicing in long sessions can lead to exhaustion and limits in information processing and memory consolidation. An important emphasis should be given to rest and sleep (Ericsson et al., 1993; Cash, 2009). Additionally, a focus solely on practice time and excessive practicing may also result in severe health problems such as physical strain, overwork, and stress (Spahn, 2015).

Since higher levels of musical expertise were found to be associated with an increase in the adoption of systematic practice strategies (Hallam et al., 2018), recent research focuses on factors associated with the quality of practice to enhance the understanding of individual differences in performance levels. In a meta-analysis, Macnamara et al. (2014) found that despite the fact that deliberate practice is important for improving performance ability, it is not the only influencing factor. Thus, issues relating to the individual use of different practice strategies seem to play a crucial role (Jørgensen and Hallam, 2016).

There is a consensus in the literature concerning the conceptualization of practice time and that practicing should be divided into formal and informal practice time (McPherson and McCormick, 2006; Miksza, 2012). Bonneville-Roussy and Bouffard (2015) proposed a theoretical framework regarding formal practice and the associated factors predicting musical achievement. The core of the model constitutes the concept of formal practice, which mediates the influence of motivational factors and practice time on musical achievement. Formal practice is defined as goal-oriented and focused learning in combination with the use of deliberate practice and self-regulation strategies. In this model, practice time exerts a positive influence on the level of musical expertise only indirectly through the utilization of formal practice strategies. In accordance with the model, Hallam et al. (2012) found that the use of effective practice strategies and the amount of practice time increased with the level of expertise, while the use of ineffective strategies decreased. This implies that an individual set of practice strategies leads to reliable and consistent improvements in performance.

Musical learning involves a certain degree of autonomy (McPherson and Zimmerman, 2011). This includes having knowledge about the relevant parts that need to be learned and knowing how to organize and manage the practicing (Ritchie and Williamon, 2013). To achieve the practicing goal, musicians need to learn how to balance the effortful components of practice involving forethought, choice, and reflection.

Another factor influencing musical achievement is the concept of self-efficacy, which is strongly associated with formal and informal practice (McCormick and McPherson, 2003). Self-efficacy is conceptualized as the belief in one's own capacity to master a specific task (Bandura and Cervone, 1986). Moreover, an individual perception of competence influences the course of actions taken to accomplish a given problem. High self-efficacy therefore provides the possibility to use complex cognitive processes, to set individual goals, and to regulate stress in difficult situations for achieving successful results in particular tasks (Ritchie and Williamon, 2011). People with high self-efficacy tend to seek challenges, work harder, use different strategies, and persevere longer (Zimmerman, 2000). For learning, self-efficacy promotes the acquisition of relevant skills, knowledge, and structured learning approaches. In musical context, it leads to effective uses of formal practice strategies (Ritchie and Williamon, 2011). Furthermore, self-efficacy has been found to be a strong predictor for musical performance quality (McPherson and McCormick, 2006; Ritchie and Williamon, 2012).

A further important factor of formal practice is self-regulated learning (McPherson and McCormick, 1999). It describes an active participation in the learning process with initiating, choosing, and performing the practice in one's own way in contrast to just following external instructions (Ritchie and Williamon, 2013). Self-regulated learning includes having relevant schemata of what has to be learned and what has to be done to improve by identifying and correcting errors and by managing the practice and one's motivation (McPherson et al., 2018). It is related to perceived competence and musical performance achievements through formal practice (McPherson and McCormick, 2006). Self-regulation differs from deliberate practice, where learners use self-regulation strategies to increase experience. McPherson and McCormick (2006) argue that for practice time to be efficient, musicians need to have knowledge of what is necessary to improve and how they can achieve that goal.

Otherwise, practice time might by reduced for building technical and motional automatisms.

Self-regulation has been shown to be correlated with the self-efficacy of learning (Ritchie and Williamon, 2013). Furthermore, advanced musicians have considerably higher self-regulatory skills, whereas less self-regulated learners rely more often on experienced others and social resources when practicing (McPherson and Zimmerman, 2011). Previous studies showed that music students practice on average about 3 h a day (e.g., Jørgensen, 2004). Nusseck and Spahn (2013) confirmed this practice duration in German music students and found that it was irrespective of the semester. However, they also showed that students pursuing bachelor's degree in music performance practiced significantly more than students who were studying to become school music teachers.

Besides practicing, music students also perform different kinds of physical activities, such as sports. A recent study on the effects of the lockdown on the well-being of performing artists found an increase in physical activities during the lockdown compared with before the lockdown (Spiro et al., 2021). In a previous study with German music students, Spahn et al. (2017) showed that in the first semester, 51% of the music students reported exercising at least once a week, and this amount increased up to 78% in the third semester 1 year later. It would be interesting to see if the increase in physical activities is even stronger during the lockdown.

Due to lockdown restrictions, music students had to adapt to new circumstances regarding their study processes and settings. A qualitative study investigated changes during the lockdown semester focusing on the relationship between music teachers and their students (Antonini Philippe et al., 2020). The authors found common themes of newly evaluating interpersonal relationships brought on by the distant contact. The music students were rethinking the relative importance of the relationship and were developing more self-involved attitudes with more autonomous behaviors, which resulted in a better understanding of their own learning. Despite these findings, little is known about differences in the practicing behavior during the lockdown compared with the usual semester.

The lockdown has challenged the music students by the absence of accustomed practicing routines and necessary facilities such as practicing rooms and may have caused particular adaptations in their practicing behavior. The lack of encounters with concerts and performances as well as instrumental and vocal lessons in online and asynchronous formats could have resulted in a decrease in or stagnation of confidence and motivation by the music students with possibly negative effects on formal practicing.

The special situation of the pandemic lockdown provided a unique opportunity to investigate direct impacts of an interruption in the University study on the practice behavior of music students. In our study, music students were asked about their practicing behavior during the lockdown, and their answers were compared with answers of students before the lockdown. In particular, the daily practice duration, the self-efficacy for learning, and aspects of self-regulated learning may differ between the lockdown and a typical semester. In addition,

the students were also asked about where they practiced, when they usually practiced during the day, and how much other non-practice-related activities they performed. The main questions of this study were as follows:

- Did the mean practice time differ between before and during the lockdown?
- Are there differences in self-efficacy for musical learning between before and during the lockdown?
- Did the music students differ in self-regulated learning aspects before and during the lockdown?
- How did the practice situation, i.e., the location and the time of day, differ between before and during the lockdown?
- Are there changes in the amount of physical activities outside the field of music before and during the lockdown?

The overall aim of this exploratory study was to investigate aspects of practice behavior in music students focusing on differences between before and during the lockdown semester 2020. The lockdown situation has changed the daily routines drastically and affected the practice behavior of music students. The study goal was to examine how the students reacted in this situation. The results help to understand the circumstances under which music students practice and contribute to the discussion of the relevance of formal practice strategies.

MATERIALS AND METHODS

Procedure

Two measurements were performed: the first in December 2019 (before the lockdown) and the second in June 2020 (during the lockdown). At the first measuring time, music students in their first semester of bachelor studies were asked for participation. At the second measuring time, music students in the second and third semesters have been considered, as first-semester students would have started their University study with the unusual lockdown semester.

At both times, the students were informed in an email about the study and were asked to fill in an online questionnaire. The web link has been provided in the email. The questionnaire was created with SoSci Survey. Considering the addressed population, about 50 music students were contacted at each measuring time.

The study has been approved by the Ethics Committee of the University of Freiburg.

Participants

In total, 33 music students at the University of Music Freiburg participated in this study: 57.6% were female and 42.4% male (**Table 1**). The average age was 20.1 years ($SD = 1.7$ years). There were no significant differences in the mean age across gender. The music students were either studying bachelor of music with a focus on performance (45.5%) or bachelor with a pedagogical focus in teaching music in schools (school music, 54.5%). The musical instruments were dispersed in instrumental categories of 27% piano, 27% vocal, 27% wind, 13% strings, and 6% percussions. No significant distribution differences of the musical instrument categories were found for gender or study profile.

	Before the lockdown	During the lockdown	In total
Amount (N)	15	18	33
Gender (in % female)	53.3%	61.1%	57.6%
Age (in years)	19.5 (1.3)	20.6 (1.8)	20.1 (1.7)
Studying bachelor of music	N = 8; 46.7%	N = 10; 44.4%	45.5%
Studying bachelor of music education	N = 7; 53.3%	N = 8; 55.6%	54.5%

At the first measuring time before the lockdown, 15 students participated in the survey. At the second measuring time regarding the time during the lockdown, 18 students took part in the study (**Table 1**). There were no significant distribution differences in the samples at both measuring times. Only the mean age was slightly higher in the second measuring time, $F_{(1, 31)} = 3.425$, $p = 0.074$, $d = 0.67$.

Questionnaire

The first block of the questionnaire consisted of general questions such as gender, age, main instrument, and study profile. Additionally, the students were asked to estimate their mean practice time per day in minutes. After that, the standardized questionnaires described below have been included.

The second measuring time took place at the end of the hard lockdown when some restrictions had already been loosened. Therefore, in the introduction of the questionnaire, the music students were asked to relate their answers to the time of the strict lockdown. In the following, this measuring time will be described as during the lockdown.

Self-Efficacy for Musical Learning

The self-efficacy scale for musical learning from Ritchie and Williamon (2011) was used. For this study, the items were translated into German. The questionnaire consists of 11 items with a 7-point rating scale ranging from 1 ("not at all sure") to 7 ("completely sure"). In a preliminary instruction, the respondents were asked to recall a usual performance or concert, imagine preparing for it, and respond to the statements with the current learning situation in mind. The higher the mean value of the scale, the higher the self-efficacy for musical learning. The self-efficacy scale showed with a single factor an internal consistency of Cronbach α = 0.82 (Ritchie and Williamon, 2011).

Self-Regulated Learning

For investigating aspects of self-regulated learning in musical context, the Musical Self-Regulated Learning Questionnaire of Ritchie and Williamon (2013) has been used. The questionnaire consists of 10 learning-related approaches to be rated as to how often the students do the described learning activity on a 7-point scale (1 = "not at all" to 7 = "always"). The items were translated into German for the purpose of this study. The questionnaire illustrates related aspects of different learning strategies on three different dimensions: (1) the scale Reflection considering the self-reflection of the practice process and the creation of frameworks for progress, (2) the scale Improvement focusing on the active pursuit of improvements inside and outside of practice, and (3) the scale Context addressing the setting of the learning context. The scale Reflection has been found to significantly correlate ($r = 0.28$) with the self-efficacy of musical learning (Ritchie and Williamon, 2013).

Questions Regarding the Practice Situation

The music students at the second measuring time during the lockdown were given additional questions regarding the practice situation. They were asked to report the frequency of practicing at specific locations and at certain times during the day on a 4-point scale (1 = "never" to 4 = "very often"). For the locations, the questions were about the University of Music, their own apartment, at the parents' home, and a specific rehearsal room. The given times during the day were in the morning, at midday, in the afternoon, and in the evening. The students were asked to provide answers referring to not only the current lockdown situation but also, in retrospect, the general situation before the pandemic.

Activities Outside of the Music Study

A particular block of questions considered the activities outside of the field of music, which has been taken from the Epidemiological Questionnaire for Musicians (EPI; Spahn et al., 2002). It addresses specific activities and the amount of regular exercises. The questions distinguish between four activity categories with general sports (such as jogging and endurance sport), relaxation techniques (such as autogenic training, yoga, and meditation), specialized body-oriented techniques (such as Alexander technique, Feldenkrais method, and dispokinesis), and psychologically oriented methods (such as mental training, supervision, self-reflection, and assertiveness training). The answers on the amount that each activity was performed were given on a 5-point scale, with 1 = "several times in a week," 2 = "once a week," 3 = "every 2 weeks," 4 = "once a month," and 5 = "never."

Data Analyses

SPSS (Version 26, Armonk, NY; IBM Corp.) was used for the data analysis. Descriptive statistics were calculated for each variable; and the mean with the standard deviation of the mean (SD) was reported. The Shapiro–Wilk test indicated that except for the practice time, the variables had a statistically normal distribution. For the parametric comparison, a one-way analysis of variance (ANOVA) was used to examine differences in all questionnaire scales and the practice time between the measuring times. The Levene F test revealed that the homogeneity of variance assumption was met. Differences between the study profiles at each measuring time were analyzed with independent t-tests. Contingency tables were used to assess the distribution differences of non-parametric variables, and chi-square statistics were stated. For the analysis of the changes in the practice

TABLE 2 | Mean values of the questionnaire scales by measuring times (brackets, standard deviation; bold, $p < 0.05$; n.s., not significant).

	Before the lockdown	During the lockdown	Statistics
Practice time a day (in minutes)	136.0 (82.1)	128.6 (66.9)	$F_{(1, 31)} < 1$, n.s.
Self-Efficacy in musical learning	56.1 (7.5)	58.1 (10.3)	$F_{(1, 31)} < 1$, n.s.
Self-regulation scale Reflection	**3.4 (1.0)**	**4.3 (1.1)**	**$F_{(1, 31)} = 6.106$, $p = 0.019$, $d = 0.89$**
Self-regulation scale Improvements	4.3 (1.2)	4.8 (0.9)	$F_{(1, 31)} = 1.820$, $p = 0.187$
Self-regulation scale Context	3.0 (1.1)	3.1 (1.1)	$F_{(1, 31)} < 1$, n.s.
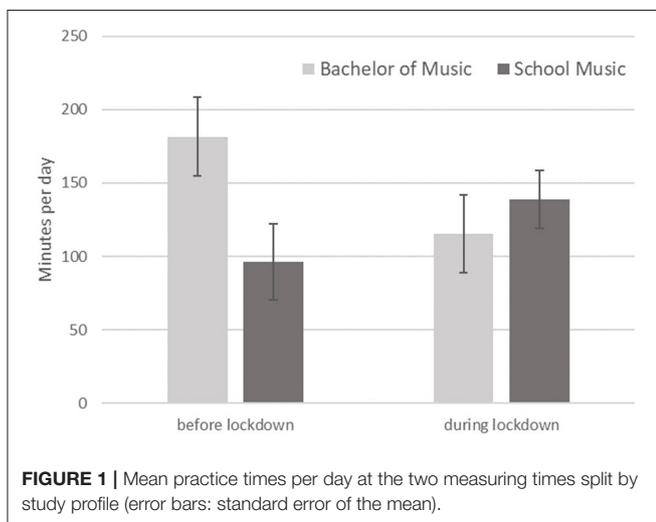
FIGURE 1 | Mean practice times per day at the two measuring times split by study profile (error bars: standard error of the mean).

location and time, Wilcoxon tests have been performed. Effect sizes were reported by using Cohen's d (Cohen, 1988). The level of statistical significance was set to 0.05.

RESULTS

Table 2 shows the mean values of all measures and the statistics of the ANOVA.

The mean practice time was not significantly different between the two measuring times. However, there was a significant difference of practice time between the studying profiles at the first measuring time, $t(13) = 2.289$, $p = 0.039$, $d = 1.185$, which was not found at the second measuring time, $t(16) < 1.0$. The mean practice time of both groups at the two measuring times is shown in **Figure 1**. Where the practice time per day of the music students with bachelor of music profile decreased from $M1 = 181.4$ min ($SD = 70.8$ min) to $M2 = 115.6$ min ($SD = 74.9$ min), the music education students increased practice time per day from $M1 = 96.3$ min ($SD = 72.8$ min) to $M2 = 139.0$ min ($SD = 61.9$ min).

The mean value of the self-efficacy scale in musical learning was not significantly different between the measuring times. Additionally, there was no significant difference found between the study profiles.

For the self-regulation scales, only the scale Reflection showed a significant difference between the measuring times with higher values during the lockdown. However, no significant difference was found for the study profile in any self-regulation scale.

There were also no significant correlations between the practice time and the self-efficacy and self-regulation scales.

In the answers to practice locations, there was a significant difference in the location at the University of Music, $Z = -3.344$, $p = 0.001$, $d = 2.39$, with less time practicing at the University of Music during the lockdown (**Figure 2**). For the location at the parents' home, a significant difference was found, $Z = -2.041$, $p = 0.041$, $d = 1.06$, with more time practicing at the parents' home during the lockdown.

The frequency of the practice time during the day showed only for the time in the evening a significant difference, $Z = -2.565$, $p = 0.01$, $d = 1.46$, with less evening practicing during the lockdown.

For the physical exercises, a significant effect of time has been found for the general endurance sports activities, $\chi^2 = 6.191$, $p = 0.013$, $d = 0.99$. At the first measuring time, 50% of the music students performed endurance sports at least once a week (**Figure 3**). This amount increased up to 88.3% at the second measuring time during the lockdown. No significant differences have been found for studying profile and gender.

DISCUSSION

Under the very unique circumstances of the COVID-19 pandemic, music students were questioned about factors of formal practicing, such as the practice time, and about self-efficacy and self-regulated learning during the lockdown. The data were compared with those of music students who answered the same questions before the lockdown during a typical semester. Unfortunately, the sample size of the study was rather small. This limited the interpretations of the analysis results, and clear conclusions could only be made with caution. However, the results provided interesting aspects of how the students changed in certain practice behaviors, which can be related to the lockdown situation.

The average amount of time spent practicing per day was about 2 h. This was slightly lower than the average practice time found in previous studies (Jørgensen, 2004; Nusseck and Spahn, 2013; Spahn et al., 2017). The mean practice time did not differ between before and during the lockdown. This indicated that the music students practiced with the same amount before and during lockdown. However, there was a variance between the study profiles. The statistical results of the practice duration in both measuring times imply that there might be an interactive effect of the study profile. The bachelor of music (BA) students practiced before the lockdown about 2 h per day. This was rather similar to the findings for the BA students of the first semester in Spahn et al. (2017). Spahn et al. (2017) found that

FIGURE 2 | Mean values of the questions where and when the music students practiced before and during the lockdown (error bar: standard error of the mean; *$p < 0.05$).

FIGURE 3 | Histogram of the amount of general sports activities by measuring times.
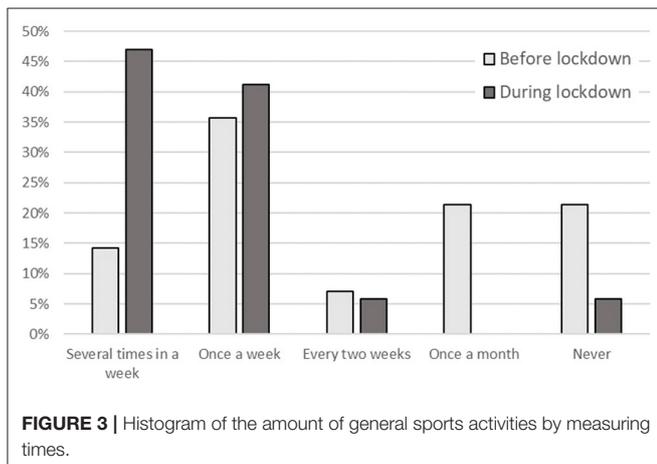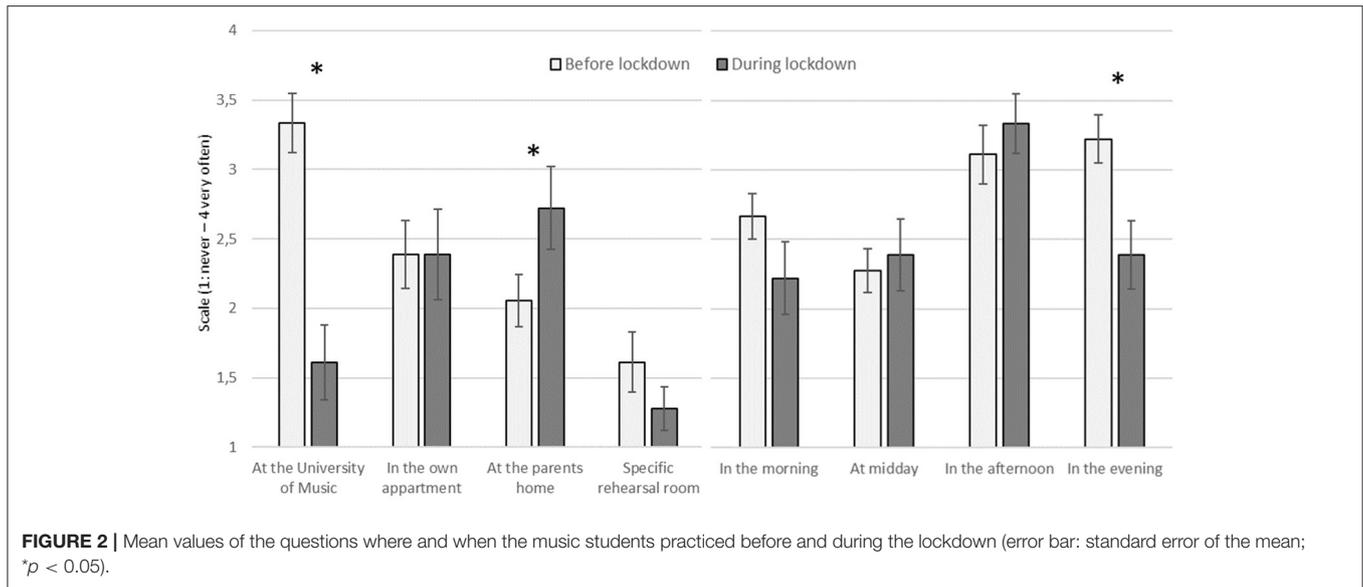
the practice time did not change in the following semesters: the BA students during the lockdown semester reported that their practice duration decreased at >1 h per day. This shows that the decrease in daily practice time could be an effect of the lockdown situation. It may be caused by the closing of the practice facilities or due to the missing pressure of routine upcoming concerts, auditions, and performances. This finding indicates that the BA students may have lost valuable practice experiences during the lockdown.

In contrast, the music students studying to become school music teachers practiced about 1.5 h per day before the lockdown and increased their practice time during the lockdown up to >2 h per day. Typically, music education students as opposed to the BA students have to attend several additional seminars and lectures regarding the curriculum for pedagogy and their second field of study. Therefore, it is known that the music education students have less time for practicing than the BA students.

During the lockdown semester, in which these additional classes were either postponed or taught in online courses, less travel between different locations was required. The music education students seemed to use this time to practice more and even approached the level similar to that of the BA students.

If motivational aspects were responsible for the decrease in practice time of the BA students, a similar decrease in the self-efficacy scale for musical learning would be expected. However, there was no difference in the self-efficacy before and during lockdown, indicating that both BA and music education students maintained confidence about their practicing also through the lockdown semester. This discrepancy of reduced practice time and remaining perceived self-efficacy leads to the assumption that the students continued believing in their success in fulfilling their musical learning progress even with less amount of practicing.

Regarding the aspects of self-regulated learning, the study found that the music students increased in the scale Reflection during the lockdown independent from the studying profile. This scale focuses on the own beliefs in decision making and choosing courses of action and specifically in self-evaluating and on the individual setting of goals for the practice target (Ritchie and Williamon, 2013). It was shown that the music students increased practicing in a more self-monitored way. This is understandable considering the reduced amount of instrumental and vocal lessons. The students had to supervise their own practicing process and outcome. This is an important factor in self-regulated learning and supports a successful learning strategy. The finding therefore indicates that the students seem to rely usually more on the teachers' advice than on their own beliefs. Due to the lockdown, the students seem to have developed this self-regulatory skill that is comparable with that of advanced musicians (McPherson and Zimmerman, 2011). Following this kind of increased autonomy, it leads to a better understanding of the

individual learning process and provides lasting forms of learning (McPherson and McCormick, 1999).

The findings of the increased self-regulated skill also confirm the findings of Antonini Philippe et al. (2020) that the music students reported of rethinking the relationship with their music teacher and used more self-involved attitudes and autonomous behaviors. Thus, the lockdown seems to have provided a platform for developing a better understanding of one's own learning.

Another particular aspect of interest was the practice location in the lockdown semester. It was to be expected that the practice time at the University of Music was drastically reduced during the lockdown. However, the music students seem to have found reliable solutions, and most of them used their parents' home for practicing. As some instruments are difficult to practice in their own apartment, the unchanged amount of practicing there indicates that the same students were still practicing in their own apartment as before the lockdown.

The usual time for practicing during the day did not significantly change during lockdown, despite the apparent decrease in practicing in the evening. This could be caused by the fact that there were no lessons or rehearsals during the day, which may usually force the students to practice more in the evening. However, since the other times during the day were similarly occupied before and during the lockdown, the students seemed to focus their practicing mostly on these times, resulting in a free evening. The students practiced more during the day and used the evening for a break in practicing. From a health perspective for musicians (Spahn, 2015) recommending a focus on rest and sleep, this indicates a good way of practicing.

The question as to what the music students actually did in the evening cannot be answered, but the findings in the answers to the physical activities may provide a hint. The execution of endurance sports increased drastically. This confirms the findings of Spiro et al. (2021). Before the lockdown, 50% of the students answered that they do sports at least once a week, which was very similar to the findings of Spahn et al. (2017). The amount of students performing sports increased up to 88% during the lockdown. This is even more than reported in Spahn et al. (2017), indicating that more students were doing sports during the lockdown semester than usual. This implies that the music students used the time not spent on traveling to University locations to also improve physical stamina and followed the recommendations of musician's health (Spahn, 2015) for doing various preventive activities regarding physical exercises. As Spiro et al. (2021) also found relations between positive well-being and physical activities, this may therefore be a positive health effect.

Limitations of the Study

The present study had some limitations regarding the methodology. A particular limitation of this study was the sample size. Despite the clearly existing statistical results, a larger sample would have provided a more detailed analysis and the potential to differentiate across the instruments. A possible increase in the sample sizes could only have been implemented by performing the survey as a multicenter study at different Universities of Music. Nevertheless, as the COVID-19 lockdown was (hopefully) a one-time situation, the study is not reproducible but provides relevant insights into the practice behavior of music students.

CONCLUSION

The findings provide certain understandings for the circumstances of practicing in music students. The lockdown situation forced both students and teachers to adapt their learning and teaching approaches. The typical one-on-one situation in instrumental and vocal lessons needed to be shifted to online classes and asynchronous learning formats. These changes created some spatial and time freedom for the students and led to an increase of their autonomy. The music students seem to have developed an individual and more self-motivated level of practicing and used their efforts more effectively to accomplish their practicing goals.

This specific transition during the lockdown semester could be used to rethink the way of teaching instrumental and vocal lessons. It showed that the change from a more teacher-mediated method of instructing and advising to a more learner-oriented method increased important skills of self-regulated learning and shifted the source of knowledge back to the student.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethical Commission of the University of Freiburg. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

All authors contributed extensively to the work presented in this paper. They contributed to the conception, design of the study, data collection, and statistical analyses. The authors co-wrote the manuscript.

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A 'PERMA' Response to the Pandemic: An Online Positive Education Programme to Promote Wellbeing in University Students

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Pre-existing issues regarding the wellbeing and mental health of university students have subsequently been compounded by the global COVID-19 pandemic. Research signals that anxiety and depression symptomology has increased in university students' following the COVID-19 outbreak, and mental wellbeing has declined. In response to concerns around mental health of students in Higher Education (HE), and to support the transition to remote working during the pandemic, we designed and implemented an 8-week wellbeing program based on positive education frameworks and practices. The online program was delivered in a West Midlands-based university in the United Kingdom, to undergraduate and postgraduate psychology students. The weekly sessions [ran through a virtual learning environment (VLE)] aimed to 1) provide students with a community and an opportunity to feel connected with other students, 2) introduce students to key concepts of wellbeing, and 3) equip students with knowledge and resources that would help sustain/improve their wellbeing. In this paper we outline how positive education, and specifically the "PERMA" wellbeing framework, has inspired the development of this wellbeing program (including the accompanying VLE webpages and sources of support) and future plans for evaluation. We further describe the content and delivery of this program alongside practical implications, lessons learned and important constraints. We situate this discussion alongside consideration of ongoing wellbeing support requirements following the pandemic and issues regarding wider integration of PERMA approaches in university contexts.

Keywords: wellbeing, mental health, higher education, positive education, PERMA

BACKGROUND

Student Mental Health and Wellbeing in HE

There is a narrative in the UK, and worldwide, that the number of university students with mental health issues is increasing; HESA (Higher Education Statistics Agency) data suggests that the number of students declaring a mental health condition on entering Higher Education (HE) has doubled within the last 3-years (Watkins, 2019). It has been estimated that between 12 and 46 percent of university students experience mental health problems (Auerbach et al., 2018; Harrer et al., 2019). Academic studies have indicated that the wellbeing levels of university students are lower than those of the general population (Roberts et al., 1999; Stewart-Brown et al., 2000), that the prevalence of depression and anxiety are heightened during university study as compared to pre-university levels

(Andrews and Wilding, 2004), and that anxiety starts to rise within students' first year of study (Bewick et al., 2010). In a study of students who receive support from university counseling services, it was noted that the severity of symptoms and level of risk to self was almost equivalent to those receiving primary care treatment in the NHS (Connell et al., 2007).

Providing a partial explanation of these rates, a 2018 ONS survey of young people revealed that 18–21 year olds are most likely to experience loneliness, with loneliness also being more prevalent in those that have undergone a life change, such as a transition to university. Subsequently it was noted, in a survey of 103 UK universities, that over 32 percent of respondents reported feeling lonely on a weekly basis ($N = 1,615$, Dickinson, 2019).

Mental illness is associated with short- and long-term outcomes and, within academic contexts, these include lowered academic engagement, achievement and drop out (Eisenberg et al., 2009; Ishii et al., 2018), as well as higher levels of academic dissatisfaction (Lipson and Eisenberg, 2018). Thereby signaling the importance of promoting and cultivating mental health and wellbeing in Higher Education Institutions (HEIs), both for students and for the continued success of HEIs.

In response to this growing concern around mental wellbeing, Universities UK has founded a Mental Wellbeing in Higher Education Group, funded research and initiatives to influence policies for wellbeing in HE (Universities UK, 2015). Student mental health and wellbeing has also been identified as a top priority by the Office for Students (Dandridge, 2018). This demonstrates that there is an increasing focus on wellbeing in HE and a call for initiatives to improve mental health and wellbeing within HE populations.

The Impact of COVID-19

ONS statistics have begun to demonstrate the impact of COVID-19 on mental health and wellbeing in the UK, including elevated levels of self-reported anxiety and loneliness and decreased levels of wellbeing (Office for National Statistics [ONS], 2020). In a 6-week study of mental health and wellbeing during the first UK lockdown (March–May 2020, $N = 3077$), O'Connor et al. (2020) found evidence that suicide ideation increased during the lockdown period. Although self-reported depression and anxiety did not increase over the lockdown period according to O'Connor et al.'s findings, depression was prevalent in approximately one in four respondents (23.7–26%) in comparison to 5.6% in general population studies, and anxiety was reported in one in five (16.8%–21%) of respondents in comparison to estimates of 5% in the general population. O'Connor et al. also noted that young people (aged 18–29°years) have been particularly affected by the pandemic. Similarly, Dawson and Golijani-Moghaddam, 2020 signaled clinically high levels of mental distress in their adult sample, and Groarke et al. (2020) indicated that having clinical symptoms of depression during the lockdown increased individuals' levels of loneliness.

These worrying statistics are mirrored in university populations, with Odriozola-González et al. (2020) observing moderate to severe levels of depression in their sample of

university staff and students in Spain ($N = 2530$). Notably, they observed that impact of the pandemic appeared to be more significant and problematic in university students as compared to staff. In the UK, Savage et al. (2020) identified that university students' mental wellbeing decreased during the first 5 weeks of the first lockdown, and perceived stress levels increased in this same period. Parallel to the argument around mental health and wellbeing in the general population and pre-pandemic, loneliness has been proposed as an underlying contributor toward poor mental health in university students during the pandemic (Hager et al., 2020).

The partial closure of universities, remote delivery of teaching and support services, social isolation of students who are unable to return home, and the level of uncertainty regarding teaching and support are all suggested to have impacted the mental health and wellbeing of university students (Burns et al., 2020). Consequently, there has been a clear demand for universities to develop action plans to address mental health issues that have been caused or exacerbated by COVID-19 (Zhai and Du, 2020).

Whilst the impact of COVID-19 on university students' academic performance currently remains unclear, research has suggested that the pandemic has negatively impacted on engagement with studies and work performance (Meo et al., 2020). It has further been suggested that the impact of COVID-19, on both academic studies and mental health and wellbeing, could be elevated in university students from low socioeconomic and socially disadvantaged backgrounds (Adnan and Anwar, 2020; tinor et al., 2020).

These findings signal a compounding effect of COVID-19 whereby the issues regarding mental ill health and lower wellbeing in university students have been further exacerbated by the pandemic. Further to this, experiencing crises can lead to enduring long-term effects, including mental illness (Schneiderman et al., 2005), and post-traumatic responses to epidemics have been previously documented (Hugo et al., 2015). This indicates that the effects of the pandemic are likely to be long-lasting with many suggesting that the COVID-19 pandemic could be followed by a mental health crisis, including the United Nations (Kelland, 2020; Savage, 2020). Together, the research evidence presented in this section signposts the urgency of addressing wellbeing in HE contexts, and the space and need for delivering wellbeing initiatives to university students.

PEDAGOGICAL APPROACH

Positive Education Approaches to Enhancing Wellbeing

Positive Psychology is considered "the scientific study of optimal human functioning [which] aims to discover and promote the factors that allow individuals and communities to thrive" (Sheldon et al., 2000, p. 1). Since its conception, there have been thousands of studies examining what these factors are (Rusk and Waters, 2013), with a vast amount of scientific research suggesting that developing individuals' "strengths of character" and personal attributes can promote wellbeing (Park et al., 2004; Peterson et al., 2007; Harzer, 2016; Goodman et al., 2017).

Positive psychology constructs that have been related to wellbeing include resilience, gratitude, mindfulness, self-compassion and hope (Boniwell, 2012). The practice and cultivation of these traits or competencies are considered avenues to fostering wellbeing, with popular examples including mindfulness techniques, resilience programmes and grateful reflection (Sin and Lyubomirsky, 2009; Waters, 2011; Donaldson et al., 2015). For instance, "counting your blessings" can instantly improve one's mood and its continued practice can lead to sustained wellbeing over time (Seligman et al., 2005; Watkins et al., 2015). Engagement in wellbeing exercises–such as grateful recounting–can become easier with practice, whereby positive memories become more accessible and there is an upward spiral effect of experiencing positive emotion (Fredrickson, 2001; Watkins et al., 2004).

Following from this, "Positive Education" is an approach borne from the field of Positive Psychology that advocates the need to teach character and wellbeing skills in educational contexts, as opposed to focusing solely on student attainment (Seligman et al., 2009). In a "whole-child approach," Positive Education aims to foster skills for happiness and wellbeing in conjunction with traditional academic skills (Seligman et al., 2009). It is proposed that this can be achieved through the identification and development of character strengths and skills for wellbeing and the cultivation of positive emotions and positive relationships within educational contexts (Durlak et al., 2011; Kern et al., 2015).

Central tenets for implementing Positive Education include that: (a) as a consequence of fostering character strengths, positive emotions, positive relationships, students' learning and academic success is also enhanced (Kern et al., 2015); and, (b), all of these dimensions can be implicitly and explicitly caught and taught (Hoare et al., 2017). Positive Education approaches have become increasingly popular within school settings (Waters and Loton, 2019), to date, an extensive and growing literature has demonstrated that promoting wellbeing skills in educational contexts can improve academic engagement and achievement (Waters, 2011). Moreover, incorporating a wellbeing focus within education can aid with self-management of mental health, protect against mental ill health, and lead to improvements in life satisfaction, learning and creativity, and social cohesion and citizenship (Kern et al., 2015).

The teaching of personal skills and attributes within educational contexts is clearly not new, and schools have long since adopted formalised approaches such as socio-emotional learning, citizenship, and personal, social, health and economic (PSHE) education initiatives (Kerr, 1999; DfES, 2005; Brown et al., 2011). It is safe to say that the positive education movement is heavily inspired by humanistic approaches to learning and character education initiatives that pre-date positive education (Kristjánsson, 2012).

To date, the application of Positive Education frameworks has largely been confined to primary and secondary education with significantly fewer attempts to embed *this particular* wellbeing approach within tertiary organisations. (Of course, related approaches such as pastoral care and improving student-educator relationships have received considerable attention (Grant and Thomas, 2006; Hagenauer and Volet, 2014)). Academics have, however, started to set out the opportunities for embedding a focus on character strengths and skills for wellbeing within universities for the purpose of improving wellbeing and enhancing learning (Oades et al., 2011; Morgan and Gulliford, 2017). This includes arguments for integrating wellbeing into the curriculum: "the learning and teaching context should be central to efforts to support and promote student mental wellbeing; this can be achieved without compromising the academic goals of higher education" (Houghton and Anderson, 2017, p. 14).

The application of positive psychology in educational contexts has often involved the delivery of discrete interventions (Shankland and Rosset, 2017; Waters, 2011). For instance, a 2-week intervention using gratitude journals (Froh et al., 2008) or a series of mindfulness meditation practices (Broderick and Metz, 2009). Hendriks et al. (2020), p. 358) define positive psychology interventions (or PPIs) as "interventions aiming at increasing positive feelings, behaviors, and cognitions, while also using theoretically and empirically based pathways or strategies to increase well-being." They contrast single component PPIs that target only one component of wellbeing (such as the counting blessings or mindfulness exercises mentioned above) with "multi-component positive psychology interventions" (or MPPIs) which draw on multiple types of activities and address multiple facets of wellbeing. This includes programmes that incorporate a "PERMA" wellbeing framework (see *Learning environment* below). It has been argued that PPIs comprising numerous components and targeting multiple facets/domains of wellbeing are more likely to lead to positive and long-lasting change (Rusk et al., 2018).

In a recent review of MPPIs (Hendriks et al., 2020), the majority of interventions were delivered online (84% of 50 studies and 6141 participants), were 8 weeks long on average, and often delivered in group settings (43%). These descriptors are mirrored in the current wellbeing program outlined in **Section 4**. Many MPPIs reviewed were designed for individuals with diagnoses of health conditions or mental health disorders (rather than for the general population) and often comprised psychotherapy or CBT components. There were only a very small number of examples of MPPIs with university students (e.g., Koydemir and Sun-Selışık, 2016; Uliaszek et al., 2016; Myers et al., 2017).

PERMA

Martin Seligman, (2011) PERMA framework is a prolific model of wellbeing within Positive Psychology which has been integrated within educational settings (Hoare et al., 2017). The PERMA framework considers wellbeing to be broadly comprised of five facets: Positive emotions (hedonic feelings of happiness such as joy and contentment); Engagement (feeling absorbed and engaged in life and connected to activities/organisations); positive Relationships (feeling socially integrated, cared about and supported by others); Meaning or purpose (believing that one's life is valuable and feeling connected to something greater than oneself); and a sense of Accomplishment (making progress toward goals, feeling capable). The PERMA models

suggests that we flourish through balancing *the Pleasant Life* (feeling good or hedonic wellbeing) with *the Meaningful Life* (having purpose, contribution and belonging, or eudaimonic wellbeing) (Seligman, 2011). This PERMA approach has subsequently been extended to recognise the importance of physical health in overall wellbeing; PERMA-H models include a positive health dimension thereby offering a more holistic view of wellbeing that includes practices for optimal physical *and* psychological health (Norrish et al., 2013; Lai et al., 2018).

Despite there being disagreement over the components of wellbeing and alternate conceptions of wellbeing proposed (e.g., Ryff (1989) theory of psychological wellbeing), there is wide agreement that wellbeing is a multi-faceted construct (Ryff, 1989; Ryan and Deci, 2001; Huppert and So, 2013). With further agreement that wellbeing includes emotional, social, psychological and functional aspects (Forgeard et al., 2011) and, more recently, physical health-related dimensions (Sears, 2013). The PERMA-H approach has been chosen here due to its explicit inclusion of physical health alongside affective, social and psychological aspects of wellbeing. Moreover, one of the underpinning tenants of the PERMA(H) model, and the subsequent measures of PERMA(H) that have been developed, is that it comprises both hedonic and eudaimonic wellbeing perspectives. One of the main criticisms of PERMA(H) has been the lack of supporting empirical evidence. However, recent efforts to address this gap have supported the PERMA facets of wellbeing across over 15,000 people worldwide, including in longitudinal studies with college students (Butler and Kern, 2016; Coffey et al., 2016). In further support of the use of PERMA, theoretical and empirical research has championed its use in educational settings (Oades et al., 2011; Norrish et al., 2013). The PERMA-H model was considered, by the current authors, as accessible to all key stakeholders involved in the program.

Integration of the PERMA-H model within schools has been linked to student, educator, and parental health and wellbeing (Vella-Brodrick et al., 2014; Williams et al., 2015; Dubroja et al., 2016). Geelong Grammar School in Australia implements PERMA-H through their "learn it, live it, teach it, embed it" ethos. This approach advocates sharing of wellbeing opportunities, concepts and frameworks; active enabling of wellbeing across school activities, and enacting wellbeing through personal use of strengths and skills; explicit teaching of character strengths and wellbeing skills within the classroom; and embedding of positive education within the entire school community including in school policies and practices (Hoare et al., 2017). Other examples of PERMA (or PERMA-H) programmes in schools include "Flourish" (Gray et al., 2020), "The Flourishing Life" (Au and Kennedy, 2018), and Maytiv positive psychology school program (Shoshani et al., 2016).

Outside of schools, a positive education approach has also been recommended for universities:

"there would seem to be an opportunity for positive psychology to enhance the experience of campus life by influencing the development of a higher educational culture that understands the psychosocial determinants of wellbeing (e.g., positive emotions-traits-institutions) and seeks to create conditions that cultivate wellbeing in students and staff" (Oades et al., 2011, p.433).

Oades and colleagues advocate for the integration of the PERMA framework across classroom and formal learning environments in universities, as well as social environments, local community, within Schools/Departments, and in student halls and accommodation. Specifically, they argue for explicit approaches to enhancing student wellbeing in HE through the cultivation of positive emotion and positive relationships, engagement in learning and the local community, and making meaningful contributions to their course and university.

PEDAGOGICAL FORMAT, OBJECTIVES AND LEARNING ENVIRONMENT

Overview of the Wellbeing Program

The aim of the wellbeing program was to 1) provide students with a community and an opportunity to feel connected with other students 2) introduce students to key concepts of wellbeing 3) equip the students with tools that would help improve their wellbeing. These aims align with the PERMA framework with regards to promoting a pleasant and meaningful life, and helps to foster a positive education approach through teaching wellbeing skills alongside academic studies (e.g., Seligman et al., 2009).

The program was organised into eight, weekly, 1-h wellbeing sessions. These weekly sessions were focused on Positive Psychology constructs and practices (see **Table 1**). The wellbeing sessions began with a brief presentation that included an introduction to the area and key constructs, and an overview of the activities. For some sessions, participants were encouraged to take part in the activities synchronously and share their thoughts or experiences. Other sessions included a toolkit of activities that participants could take away with them. All wellbeing sessions and activities were uploaded to a supporting VLE, where students could access the resources outside of the wellbeing sessions.

An 8-week program was deemed suitable as previous literature has suggested positive psychology interventions typically range from 4–8 weeks (e.g. Bolier et al., 2013). Moreover, lengthy interventions contribute to high levels of attrition amongst participants (Ryan et al., 2010). The first weekly wellbeing session took place on 25th March 2020, with the final session on the 13th May 2020[1].

Learning Environment

The wellbeing program took place in a university in the West Midlands, UK. The university is a medium-sized, campus university with approximately 10,000 students and a larger than average proportion of mature students (over the age of 21) and students from diverse backgrounds or those entering

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[1]It should be noted that this period coincided with the university's examination and assessment period. During the program (March–May 2020), students were undergoing preparation of assessments and one of two assessment submission periods in the academic year.

TABLE 1 | Overview of weekly wellbeing sessions, activities and PERMA-H focus[a].

Week	Theme/Positive psychology Construct(s)	Session content	Activities	PERMA-H focus[b]
1	Introduction to wellbeing	Introduction to the program and discussion of what wellbeing is (including hedonic and eudaimonic perspectives, and PERMA)	- Introduction to wellbeing models, tour of the VLE website, introduction to wellbeing practices - 2020 occurrence[c]: Activity involving sharing images and tips for remote working and social connection whilst in lockdown	P,E,R,M,A,H
2	Positive emotions	Introduction to positive emotions and related theories (e.g., Fredrickson (2001) broaden and build theory)	- Reflective exercise around the people, events or "things" that evoke feelings of happiness. Participants were asked to share images of what makes them happy using the platform padlet - Program participants jointly created a "Feel Good" playlist of songs that create positive emotions. This playlist was then made available to all students in the School of Psychology	P
3	Gratitude and Positive Reframing	Introduction to gratitude and gratitude exercises (e.g., counting blessings and gratitude letters), followed by an introduction to positive reframing and reframing exercises. Please note that the positive reframing exercises were introduced alongside cautionary guidance around the content and frequency of reframing and the role of negative emotions in wellbeing	- The gratitude exercise comprised an adaptation of the well-known "counting blessings" exercise. In recognition of the different forms of gratitude that one can experience (outlined in the introduction to gratitude section of this session), students were presented with three columns. "I am grateful to for"; "I am grateful for"; and "I am grateful that". Students were asked to reflect on three things that they are grateful for and add to the relevant columns - Positive reframing exercise: Students were asked to consider their current living and working arrangements (with a focus on the pandemic), and share the positive elements that they are able to take from these situations (e.g., no commuting)	P,R
4	Mindfulness and Self-compassion	Introduction to the concepts of mindfulness and self-compassion, including how the two are linked	-Mindfulness exercise: Students were invited to take part in a short mindfulness meditation and reflect on their experience of this - Self-compassion exercise: Adaptation of Kristin Neff's "How would you treat a friend?" exercise (available via https://self-compassion.org/) Group discussion of how we treat and speak to ourselves versus others	P,E,R
5	Physical Health	Why physical activity is good, physical activity and COVID-19 restrictions, hints and tips around exercising for wellbeing	- Students were asked to share the types of physical activity there were currently engaging in -Share and discuss activity around tips for exercising during lockdown	E,A,H
6	Alleviating Stress	Introduction and definition of stress	- Solution-focused thinking exercise: Students each considered what prompts stress and shared ways to alleviate stress (with a peer support emphasis) - Expressive writing exercise: Participants were asked to consider a stressful event and engage in an expressive writing exercise for 10 to 15 min to recognise and combat their stress response	E,H
7	Resilience	Introduction and discussion of the concept of resilience (e.g., as a trait or process, as multi-faceted etc.). A particular focus on self-awareness was taken in the 2020 occurrence	-Students were encouraged to practice self-awareness. They did this by writing a description of a negative event and considered which aspects were in and outside of their control -This framework was further used to consider responses to the pandemic	P,M,A
8	Hope and Optimism	Introduction to the concepts of hope and optimism, including how they are related but distinct. Activities and discussions were focused on maintaining wellbeing following the conclusion of the program	-Best possible selves exercise: Students were asked to reflect on an aspect of their ideal life in the future (e.g., best possible social life, work life or family life) and write a statement on what this looked like to them. These were then discussed together as a group - Hope exercise: Students were also asked to create a "Hope Map." This involved considering their future goals, the pathways and motivations to meet those goals, and the possible obstacles they may need to navigate. Students were presented with an adapted version of Michelle McQuaid's Hope Map (available via www.michellemcquaid.com)	P,M,A

[a]Further details on the session content and activities is available on request through contacting the corresponding author.
[b]P, Positive emotion; E, Engagement; R, positive Relationships; M, Meaning; A, Accomplishment; H, Health.
[c]A selection of activities in the 2020 occurrence were about adjusting to changes in light of the recent national lockdown. The 2021 occurrence of this program has been adapted in line with the changing context (e.g., considering long-term coping responses to the pandemic), and new activities have been added [e.g., in session 1 of the 2021 occurrence the remote learning activity has been replaced with one hedonic wellbeing activity (reflecting on a humorous event) and one eudaimonic wellbeing activity (recognition of accomplishments)].

university through access to HE routes. The wellbeing program was delivered within the School of Psychology, which consists of approximately 500 undergraduate students and 60 postgraduate taught students. Participation was on a voluntary basis and attendance was not logged.

The wellbeing program was delivered by a range of lecturing staff in the School of Psychology. The weekly sessions were delivered by staff synchronously through an online Virtual Learning Environment (VLE). The practical implications of this will be further discussed in *Practical Implications and Lessons Learned*.

RESULTS TO DATE

This wellbeing program was implemented as an opportunity for students to enhance their wellbeing and socialisation at the beginning of the COVID-19 pandemic. At that time, the priority and focus was on providing wellbeing support in a timely fashion rather than on setting up an evaluation of the program's efficacy. Although anecdotal feedback indicated this intervention was a useful resource for students during the initial months of the pandemic, an evaluation of this wellbeing program is required.

Consequently, during the 2020-2021 occurrence of this wellbeing program (starting in Semester 2 of the 2020–21 academic year), an evaluation of the program will be conducted. The evaluation will involve a repeated-measures, mixed research design with pre and post quantitative surveys and follow up qualitative interviews. A control group from the same student cohort who do not opt-in to the program will be sought for comparative purposes. In the quantitative stage of the research, students will be asked to complete measures of wellbeing, anxiety, depression, academic burnout and sense of community. These measures will be completed in the week preceding the wellbeing program, and the week following the completion of the 8-week program. Following from previous positive psychology interventions and the underpinning PERMA-H framework, it is anticipated that, following the program, students' self-reported levels of wellbeing and sense of community will increase, and that self-reported anxiety, depression and academic burnout will decrease. It is also anticipated that the magnitude of these effects will be contingent on the number of sessions students have engaged with and the degree to which wellbeing practices are performed outside of the weekly sessions.

Students who complete the program will be invited to take part in a semi-structured qualitative interview. The objective of this qualitative phase is to obtain deeper insight into the participants' experience of the 8-week program, including perceived benefits in relation to the PERMA framework. The qualitative phase will also assist in informing future delivery of the wellbeing program by identifying any barriers or difficulties encountered during participation.

PRACTICAL IMPLICATIONS AND LESSONS LEARNED

The use of internet-based interventions to support wellbeing in higher education has been encouraged (Royal College of Psychiatrists, 2011), with online interventions having greater feasibility in comparison to traditional face-to-face or blended delivery approaches due to the ease of accessing the programmes and its flexible engagement (e.g., Schreiber and Aartun, 2011). Moreover, online interventions have been shown to be beneficial for those who are resistant to seek help due to stigma, which makes them accessible to individuals who may have not sought support previously (Barrable et al., 2018). A recent systematic review highlighted the usefulness of internet-based interventions in accommodating the diversity of mental health conditions present in university students in addition to promoting general wellbeing (Harrer et al., 2019). It is also important to note here that during the early stages of the pandemic, the UK was in lockdown, meaning that online delivery was the only option for this wellbeing program due to the government restrictions. Therefore, the implementation of an online wellbeing program was not only a practical approach but the only feasible one. In terms of engagement in programmes during the pandemic, research has indicated that face-to-face wellbeing programmes may have encouraged *more* active engagement and social integration with peers (Huber et al., 2018). This indicates the importance of considering the balance between accessibility and engagement for future program delivery.

As outlined in *Pedagogical Format, Objectives and Learning Environment*, the wellbeing program was delivered using a VLE. The VLE was a useful platform through which students could attend the weekly wellbeing sessions but also gain extended access to the sources of wellbeing support. Offering this permanent access to materials was an important component of the program as self-management of wellbeing and mental health is a useful tool for individuals who are reluctant to seek formal support (Griffiths and Christensen, 2007). This approach sought to promote autonomy and self-facilitation of wellbeing, akin to similar online interventions (e.g., Papadatou-Pastou et al., 2019).

During the wellbeing sessions participants were encouraged to share their thoughts and experiences, ergo an associated risk with this approach was that participants might disclose information about their mental health or a mental illness which could prompt safeguarding issues and create discomfort for other students. At the beginning of the program, participants were asked to follow a set of "guidelines" with regards to appropriate disclosure. For example, students were informed that "when engaging with any discussion forums or interactive activities on this site, please refrain from disclosing information that others might find distressing" and "interaction with this site is not anonymous, therefore, any private discussions should be directed toward your Personal Academic Tutor." Program facilitators had the responsibility of enforcing these guidelines and continually made students aware that the wellbeing program was not designed to offer specific, tailored mental health or mental illness support. Whilst the remit of the program was clearly communicated to students, this could have contradicted students' expectations.

Relatedly, constant vigilance around students' posts and comments was required. For each wellbeing session, a minimum of two members of staff were present; with one member of staff acting as a facilitator of the activities and the other as a moderator of the conversation to ensure that comments

in the chat box were safe and appropriate (see Taylor et al., 2016). The facilitators of the program had research expertise and knowledge of the area of wellbeing, however, it is important to note that the staff were not formally trained in providing wellbeing interventions.

Staff delivering the program had ongoing, professional relationships with the students. This familiarity with staff could have encouraged student participation (Jorm and Griffiths, 2006), however, could also be viewed as a limitation with regards to the balance of power. Typically, lecturers are perceived to own the power, due to their role in directing students to complete tasks (Michail, 2011). With regards to the wellbeing intervention, lecturers as facilitators meant that the students may have viewed the sessions as another type of teaching and learning experience. This may have also had a negative impact on the extent to which students shared information with their peers in the sessions (e.g., through feeling uncomfortable or reluctant in sharing personal information with a member of staff). Because of this, participants were allowed to remain in the session to talk with peers, after the facilitators had left. Due to the aforementioned issues regarding disclosures, it is important to note that trained peer mentors were present in these discussions. To help counteract any social isolation as a result of the first national lockdown, further peer support and social connectedness was encouraged in the wellbeing sessions through the use of "Padlet"[2], a chat box and the use of microphones and video during the session to facilitate conversation.

One practical implication to consider with regards to the delivery of this program was its voluntary nature. Student engagement was an important aspect of the weekly wellbeing sessions and arguably, students who are less engaged in their academic studies, may be less likely to engage in a wellbeing program (e.g., Bond et al., 2020). Crucially, these less engaged students may benefit more from a wellbeing program due to the notion that wellbeing can increase academic engagement and achievement (Seligman et al., 2009; Waters, 2011). This signposts that not all students are likely to engage and benefit from the current approach. Moreover, students' mental health literacy may have also influenced their engagement; students who have increased knowledge of mental health literacy and wellbeing demonstrate self-management (Gulliver et al., 2010), suggesting that there may be a level of self-motivation to engage in such a wellbeing program. Consequently, those lacking self-motivation may not benefit from a program like the one we have described here.

CONSTRAINTS RELATING TO THE PROGRAM AND APPROACH

This wellbeing intervention was designed in response to the pandemic and in a short period of time. In the UK, the lockdown restrictions began on the 16th March 2020 and the wellbeing program was implemented on the 25th March 2020. As a result of this short timescale, the staffing of the wellbeing program presented challenges

at times. This was due to the wellbeing sessions being delivered in parallel with lectures, seminars and student tutorials, alongside extended assignment deadlines. At the time of the program, staff were also tasked with moving the delivery of teaching online, in addition to maintaining their duties in providing academic and pastoral support to students. This indicates implications of delivering the 8-week program on staff workload.

Resultantly, increasing student wellbeing provision in the School during this challenging time could have had knock-on (or trade-off) effects in terms of staff wellbeing. This brings into question where wellbeing programmes should be situated-at a School/Departmental or organisational level? At a School level, relationships between staff and students have already been established, which could encourage participation (Jorm and Griffiths, 2006). Alternatively, at a wider organisational level, wellbeing provision could be delivered centrally by trained staff, where this commitment is recognised in job role and workload.

The program itself was not cost-intensive as there were no financial requirements in the creation or delivery of this program (especially as staff time was not compensated in this occurrence). This should be considered an advantage to the HEI given the well-documented budget cuts to HE over the past decade. These budget cuts have changed the landscape of Higher of Higher Education and made HEIs reliant on fees provided from students, rather than on government funding (House of Commons, 2020). Consequently, budget cuts have altered the priority of HEIs to focus on the recruitment and retention of students (e.g. Calma and Dickson-Deane, 2020). There is an argument that wellbeing interventions could help with the retention of students at universities, particularly as students often withdraw university due personal reasons, including mental health (Van Bragt et al., 2011). Therefore, investing in student mental health and wellbeing support should pay dividends not only in terms of mental health outcomes but also in terms of continuation of studies, student fees and satisfaction metrics. This could be further explored in future research projects, examining the longitudinal effects of wellbeing interventions on retention.

The current wellbeing program follows an MPPI approach which is commonly utilised within positive psychology and integrated into educational contexts (Hendriks et al., 2020). However, an arguably more effective approach to cultivating wellbeing is to embed character and wellbeing enhancement into the curriculum (Hoare et al., 2017)–a suggestion that has previously been advocated within HE. For example, Houghton and Anderson (2017) have argued for a "whole-university" approach where wellbeing is incorporated into the curriculum, learning support, specific disability and mental health services, and wider university services (not dissimilar to the Healthy Universities approach, Dooris et al., 2010). Houghton and Anderson further suggest that wellbeing should be embedded into the curriculum *content*, so students can understand the concept of wellbeing, and within curriculum *processes* as to foster inclusive practices and a sense of belonging.

The aforementioned points regarding voluntary wellbeing programmes being reliant on engagement and self-motivation (Bond et al., 2020) provide further support for wellbeing being embedded into the curriculum content and processes to ensure

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[2]Padlet is an online platform where participants are allowed to post and share their thoughts, ideas and images.

that all students can access its benefits. This is not an easy goal to accomplish, however, as it requires an explicit joined-up approach throughout the HEI. Akin to how whole-school, multi-component approaches to mental health and wellbeing that comprise collective action appear more effective in promoting wellbeing and accounting for the complexities in school systems (Hoare et al., 2017), a whole-university approach that integrates and embeds wellbeing throughout its systems is likely to offer increased effectiveness over stand-alone programmes in HEIs. In line with Oades et al. (2011), it is our hope that HEIs will move toward a consistent integration of wellbeing frameworks, such as PERMA, across the various levels in which it works with wellbeing embedded into curricula in addition to the existing central provisions that are well established.

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DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

Both authors contributed to the development of this article, and to the development and delivery of the wellbeing programme outlined. BM has led on the conception and design of the wellbeing programme and the Frontiers article with substantial contribution from LS.

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Changes in and Effects of Foreign Language Classroom Anxiety and Listening Anxiety on Chinese Undergraduate Students' English Proficiency in the COVID-19 Context

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The present longitudinal survey study explored changes in and effects of foreign language classroom anxiety (FLCA) and listening anxiety (FLLA) on Chinese undergraduate students' English proficiency over a semester in the COVID-19 context. A set of 182 matching questionnaires was collected from first-year undergraduate English as a foreign language learners at two time points of a 16-week semester. Analyses of the data revealed the following major findings: (1) the participants experienced high levels of FLCA and FLLA both at the beginning and end of the semester, neither of which changed significantly during the semester, (2) FLCA and FLLA were highly positively related to each other, (3) FLCA and FLLA significantly predicted students' self-rated proficiency in listening and speaking English, and (4) confidence in using English, efforts and motivation to learn English and interaction with instructors and peers mediated FLCA and FLLA to exert effects on students' self-perceived proficiency in listening and speaking English. These findings indicate that the learning environment is critical in influencing the levels of and changes in FLCA and listening anxiety and that these two types of foreign language anxiety are serious issues in the pandemic foreign language learning context.

Keywords: foreign language classroom anxiety, foreign language listening anxiety, longitudinal survey study, COVID-19, English proficiency

INTRODUCTION

Foreign language anxiety is a negative side of emotion specifically related to second/foreign language learning (MacIntyre and Gardner, 1994) and has received considerable attention from researchers in the field (MacIntyre, 2017). As a specific type of foreign language anxiety, foreign language classroom anxiety (FLCA) has been widely researched and proved to be predominantly negatively associated with second/foreign language learning processes or outcomes (e.g., Horwitz et al., 1986; Young, 1986; Aida, 1994; Gregersen and Horwitz, 2002; Botes et al., 2020; Gregersen, 2020; Liu, 2006; Liu and Jackson, 2008). These studies have also revealed that speaking is the most anxiety-provoking activity in second/foreign language learning. By contrast, also as specific types of foreign language anxiety, language skill-related anxieties like listening anxiety,

reading anxiety and writing anxiety have been much less investigated in spite of their existence in second/foreign language learning (Phillips, 1992; Cheng et al., 1999; Elkhafaifi, 2005; Jee, 2016). Of the four language skills, listening is viewed as the most frequently used language skill (Scarcella and Oxford, 1992), but "is probably the least explicit of the four language skills, thus, making it the more difficult skill to learn" (Vandergrift, 2004, p. 1). Consequently, foreign language listening is rather challenging and anxiety-provoking to second/foreign language learners (Elkhafaifi, 2005; Liu, 2016). Nevertheless, though foreign language listening anxiety (FLLA) has received more researchers' attention and been found to be negatively associated with learners' listening performance (e.g., Elkhafaifi, 2005; Golchi, 2012; Zhang, 2013; Liu, 2016), it still remains under-researched.

As reviewed below, Chinese learners of English at different educational levels often experience anxiety to varying degrees, which is largely because they have limited use of English in daily life (Liu, 2006, 2016; Lu and Liu, 2015; Liu and Xiangming, 2019). They may experience greater anxiety in online learning classrooms when they have even less use of English due to limited interaction and low motivation (Chen, 2010; O'Doherty et al., 2018). Since the outbreak of the pandemic COVID-19 in late 2019, schools in many countries at all levels, including China, are closed and shift to online teaching and learning. Facing this unexpectedly new context, students may encounter numerous challenges and experience various feelings they have seldom had before (Bryson and Andres, 2020). It is thus necessary to examine anxiety in Chinese English as a foreign language learners in this COVID-19 context.

Meanwhile, although the current literature shows that foreign language anxiety, including FLCA and FLLA, is dynamic and multifaceted, studies on changes in different types of anxiety are still inadequate (Liu and Xiangming, 2019; Gregersen, 2020). Even fewer studies are available on the interaction of FLCA and FLLA though they have been shown to be independent constructs of foreign language anxiety (Horwitz et al., 1986; Elkhafaifi, 2005; Bekleyen, 2009).

For these reasons, the present longitudinal survey study aims to examine changes in FLCA and FLLA and their effects on Chinese undergraduates' speaking and listening proficiency in English in online English language class over a 16-week semester in the COVID-19 context.

LITERATURE REVIEW

Foreign Language Classroom Anxiety

Initially treated as a psychological construct, anxiety refers to "the subjective feeling of tension, apprehension, nervousness, and worry associated with an arousal of the autonomic nervous system" and generally has three types: Trait anxiety, state anxiety and situation-specific anxiety (Spielberger, 1983, p. 1). As a type of situation-specific anxiety, foreign language anxiety concerns "the feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening, and learning" (MacIntyre and Gardner, 1994, p. 284). Due

to the lack of uniform measures, early studies (e.g., Chastain, 1975; Kleinmann, 1977) revealed inconsistent findings about the role of anxiety in second/foreign language learning. To solve this problem, Horwitz et al. (1986) proposed the FLCA theory, according to which FLCA is "a distinct complex of self-perceptions, beliefs, feelings and behaviors related to classroom learning arising from the uniqueness of the language learning process" (p. 128). To measure this situation-specific type of foreign language anxiety, Horwitz et al. (1986) developed a 33-item Foreign Language Classroom Anxiety Scale covering three dimensions: Communication apprehension, fear of negative evaluation, and test anxiety. Soon, the scale has been widely used by researchers worldwide to explore the relationship between FLCA and second/foreign language learning outcomes measured by language achievement/performance tests, course grades, and/or self-ratings (e.g., Young, 1986; Aida, 1994; Cheng et al., 1999; Matsuda and Gobel, 2004; Liu and Jackson, 2008; Liu and Huang, 2011; Liu and Cheng, 2014; Piniel and Csizér, 2015; Boudreau et al., 2018; Liu, 2018; Liu and Xiangming, 2019; Xiangming et al., 2020; Shirvan and Taherian, 2021). In addition to the consistently negative correlation between FLCA and second/foreign language learning outcomes, these studies have discovered that students are most anxious about speaking the target language in classrooms. Furthermore, these studies, together with those using other measures such as interviews and diaries (e.g., Bailey, 1983; Liu, 2006; Bekleyen, 2009; Jee, 2016), have shown that FLCA levels differ not only in different second/foreign language contexts but also in the same second/foreign language contexts over time, because it continuously interacts with various variables such as familiarity with peers, use of the target language, motivation, enjoyment and self-confidence. For example, using the idiodynamic method, Gregersen et al. (2014) studied three high- and three low-anxiety learners of Spanish as a foreign language via videotaped presentations, self-ratings of anxiety levels and interviews. The results showed many fluctuations in the participants' anxiety levels during their presentations. Kruk (2018) investigated the changes in the levels of FLCA of 52 Polish senior high school leaners of English over one school semester. Analyses of the collected questionnaires, interviews and lesson plans revealed that FLCA changed not only over the whole semester but also during a single class and from one language lesson to another. Liu and Cheng (2014) examined the relationship between foreign language anxiety and motivation of first-year university students. They found that anxiety levels were significantly lower when students had a higher degree of motivation, which was especially evident among advanced-level students.

Clearly, FLCA, with a focus on speaking, has been much researched: It is existent in many second/foreign language learners and largely negatively affects their learning of the language, and it is changeable during the learning process because of various reasons and interacts with other variables such as motivation and strategy use to affect learning outcomes. Seemingly, learners may also experience other types of anxiety during the learning process like listening anxiety, reading anxiety and writing anxiety, which, nevertheless, have been much less investigated (Phillips, 1992; Cheng et al., 1999; Elkhafaifi, 2005;

Jee, 2016). Even fewer studies can be found on the interaction of FLCA and other types of anxiety.

Foreign Language Listening Anxiety

As more research has been conducted within the FLCA theory, researchers are more aware of the need to examine other types of foreign language anxiety, especially language skills-related anxiety such as listening anxiety, speaking anxiety, writing anxiety and reading anxiety. Consequently, efforts have been made to investigate these types of anxieties (e.g., Sellers, 2000; Gregersen and Horwitz, 2002; Cheng, 2004; Elkhafaifi, 2005; Horwitz et al., 2010; Pae, 2013; Lu and Liu, 2015), which have been shown to be distinct and independent from FLCA and consistently negatively related to the specific language skills and second/foreign language learning outcomes.

Though speaking is widely acknowledged to be the most anxiety-provoking activity in second/foreign language learning (Horwitz et al., 1986; Liu and Jackson, 2008), listening is also a very stressful task for second/foreign language learners (Arnold, 2000). Also as a type of situation-specific anxiety, FLLA refers to the tendency that foreign language listeners become anxious in listening-related tasks (Zhang, 2013; Liu, 2016). Studies have evidenced that FLLA is distinguishable from general foreign language anxiety but positively correlated with it (Kim, 2002; Elkhafaifi, 2005; Bekleyen, 2009; Wang, 2010; Golchi, 2012; Serraj and Noordin, 2013). Studies have also revealed a significantly negative association of FLLA with foreign language listening performance (Elkhafaifi, 2005; Kim, 2002; Mills et al., 2006; Golchi, 2012; Serraj and Noordin, 2013; Zhang, 2013; Liu, 2016; Wang and Cha, 2019). For example, Elkhafaifi (2005) examined the effects of general foreign language learning anxiety and FLLA of 233 postsecondary students of Arabic as a foreign language on their final grades and listening comprehension scores. The results showed that both types of anxiety negatively affected students' listening comprehension and final grades.

Meanwhile, the current literature shows that FFLA interacts with various variables such as language proficiency, strategy use, self-efficacy and motivation to collaboratively affect listening learning outcomes, as does FLCA (e.g., Kim, 2002; Mills et al., 2006; Golchi, 2012; Liu, 2016; Xu and Huang, 2018; Wang and Cha, 2019). For example, learners with high self-efficacy in their listening capabilities become less anxious while listening to a foreign language (Kim, 2002; Mills et al., 2006). Liu (2016) investigated the relationship between FLLA and strategy use and their predicting effects on test performance of Chinese university students at different English proficiency levels. The results showed that FLLA and strategy use were closely correlated but FLLA was not a powerful predictor for listening test performance when strategy use was considered. Wang and Cha (2019) examined the FLLA of 78 English majors of different English proficiency levels and its effect on their listening performance. They found that English proficiency mediated the effect of FLLA on students' listening performance. Listening anxiety was a negative predictor while self-belief was a positive predictor for less proficient listeners' listening performance. Yet these two factors had no predicting power for the high-proficient group's listening performance.

On the one hand, research on FLLA is relatively inadequate in spite of increasing attention to the issue. On the other hand, little research can be found on changes in FLLA over time though FLLA should be dynamic as well, just like FLCA. Thus, longitudinal studies are needed to examine the dynamic nature of FLLA in various language learning contexts. In addition, since speaking and listening are often intertwined in language learning, FLCA and FLLA may mutually affect each other, as implied in the reviewed literature (Bailey, 1983; Kim, 2002). This, yet, remains to be researched.

Research on Foreign Language Anxiety in Online Learning Environments

In spite of the plethora of studies on anxiety in various second/foreign language learning contexts, few such studies have been done in online learning environments (Hurd, 2007; Hurd and Xiao, 2010). Online learning is the form of education that takes place over the Internet, where students engage with instructors and other students at their convenient time and place (Singh and Thurman, 2019). Development in information and communications technology eliminates the barriers of time, space, and pace, creating greater flexibility in learning and teaching activities (Aparicio et al., 2017). Nevertheless, some researchers are skeptical about online teaching and learning in that students may experience isolation and struggle to stay motivated, to have adequate face-to-face interaction and get timely responses and feedback (Chen, 2010; O'Doherty et al., 2018). All these may hurt their sense of belonging and confidence in learning (Lei and Gupta, 2010; De Paepe et al., 2018; Janse van Rensburg, 2018). All these are especially important for second/foreign learners, which requires repeated exposure to and practice of the target language in various forms to learn it well.

In terms of foreign language anxiety in online learning environments, studies have revealed different findings (Hurd, 2007; Coryell and Clark, 2009; Hurd and Xiao, 2010; Côté and Gaffney, 2018), which might be due to different learning tasks used in the research. For example, Hurd and Xiao (2010) found that Chinese university students of distance learning were slightly anxious when learning English and felt more anxious when using vocabulary and speaking English. Similarly, the twelve interviewees in Coryell and Clark (2009) remained anxious in the online setting because they focused too much on correctness and precision of their language performance. Côté and Gaffney (2018) explored the effect of typed synchronous computer-mediated communication on foreign language anxiety and output quantity of 61 beginner French learners. They found that compared with traditional classrooms, the participants felt significantly less anxious and produced more conversation turns and words in the online learning context.

Meanwhile, Hurd (2007) investigated changes in anxiety in 500 students enrolled in an online lower-intermediate French course over a 4-month period. The results showed that more than half students' anxiety levels remained unchanged and some learners tended to be more anxious after 4 months of study. The study also discovered that the participants' anxiety mainly arose from speaking, such as being called to speak or being fearful of

not being understood. Other sources of anxiety included lack of instant feedback, difficulty in assessing personal progress in comparison with other students, isolation, lack of opportunities for speaking practice, lack of confidence when working on their own, and lack of task instructions. Kaisar and Chowdhury (2020) explored whether technology-based virtual classroom could free foreign language learners from anxiety. Analyses of the data collected from a self-developed questionnaire and interviews demonstrated that most students felt more comfortable in face-to-face classrooms than in virtual classrooms. The participants reported that virtual study could not give them opportunities for interactive activities, which made the language class boring and unfruitful. In addition, they attributed their anxiety to such factors as fear of being disconnected, fear of being isolated, lack of interaction with teachers and peers, and network problems.

Context

To respond to CONVID-19 since its outbreak, the Ministry of Education in China launched an emergency policy initiative entitled "Disrupted Classes, Undisrupted Learning," to close schools but continue the process of teaching and learning by providing flexible online education via major online platforms like Zoom and Tencent to over 200 million students (Wang et al., 2020). All teaching and learning were conducted online for the first semester of the year 2020 and half online and half in classrooms for the second semester of the year. Thus, how students feel about English speaking and listening in online foreign language classrooms and how this affects their proficiency in speaking and listening English in this special period deserve research, which is the focus of the present research. Targeting Chinese first-year undergraduate students, the present research aims to answer the following research questions:

(1) How do students' foreign language classroom anxiety and listening anxiety change over the semester?
(2) How are students' foreign language classroom anxiety and listening anxiety correlated with each other?
(3) How do students' foreign language classroom anxiety and listening anxiety affect their proficiency in speaking English?
(4) How do students' listening anxiety and foreign language classroom anxiety affect their proficiency in listening English?

THE PRESENT STUDY

This study was conducted in a public university in Beijing, where an English language course was mandatory for all first- and second-year undergraduate students, aiming to enhance their listening, speaking, reading and writing skills. As newcomers of the university, more than half first-year students took the English Listening and Speaking course. Coupled with the fact that they were new to the online teaching and learning environment due to COVID-19 in the university and thus might experience greater anxiety than their peers in senior years of study, they became the target population of the present research.

Participants

Altogether 182 (137 male and 45 female) first-year undergraduate students registered in the English Listening and Speaking course participated in the present study. With an average age of 18.15 ($SD = 0.70$) and an age range of 17–21, the respondents majored in various areas such as electric engineering, computer science, artificial intelligence, information technology, internet security and information communication.

Instruments

The respondents answered a battery of questionnaires: The background information questionnaire, the Foreign Language Classroom Anxiety Scale, the Foreign Language Listening Anxiety Scale, and self-rated English proficiency and learning of English, as detailed below.

Background Information Questionnaire

The Background Information Questionnaire sought to collect such information about the respondents as name, gender, discipline, age, and average use of English per day. Meanwhile, the informants were asked to self-rate their learning of English on the scale of 1 to 10: Ease of searching for materials in English, ease of communicating with others in English, ease of looking for help with English learning, interest in learning English, motivation to learn English, efforts to learn English, confidence in using English, interaction with peers, and interaction with the course instructor. As reported in **Table 1**, the students rated their learning of English at a similar level in all aspects in both phases.

Foreign Language Classroom Anxiety Scale

With a reliability score of 0.947 in phase 1 and 0.949 in phase 2, this 33-item Foreign Language Classroom Anxiety Scale (FLCAS) was adapted from that developed by Horwitz et al. (1986), primarily aiming to measure students' anxiety levels in English language classrooms, as done in similar studies (e.g., Hurd and Xiao, 2010; Liu and Xiangming, 2019; Xiangming et al., 2020). To better suit the present situation, expressions 'foreign languages' were changed to be 'English.'

Foreign Language Listening Anxiety Scale

Achieving a reliability score of 0.896 in phase 1 and 0.905 in phase 2, the 20-item Foreign Language Listening Anxiety Scale (FLLAS) used in the present study was adopted from that used in Zhang (2013), aiming to measure respondents' English listening anxiety.

All the FLCAS and FLLAS items were placed on a 5-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree' with values 1–5 assigned to each of the descriptors respectively.

Self-Rated English Proficiency

The respondents were asked to self-rate their proficiency in English listening and speaking on the scale of 1 (lowest) to 10 (highest), as done in Young (1986) and Liu (2018).

Procedure

After the design was approved by the Research Committee of the department and the university, the data were collected at two time points over a 13-week period in a 16-week semester. The battery

Self-rated learning of English	Phase 1		Phase 2		Paired samples *t*-test results	
	Mean	SD	Mean	SD	t	p
Average use of English per day	0.895	0.69	1.02	1.57	−1.232	0.220
Ease of searching for materials in English	5.05	2.26	4.99	2.46	−0.176	0.860
Ease of communicating with others in English	4.30	2.23	4.52	2.38	−1.014	0.312
Ease of looking for help with English learning	5.02	2.31	5.12	2.39	−1.105	0.271
Interest in learning English	5.56	2.29	5.74	2.53	−0.954	0.341
Motivation to learn English	5.50	2.25	5.55	2.45	−0.022	0.982
Efforts to learn English	4.48	2.02	4.35	2.21	0.717	0.474
Confidence in using English	4.30	2.34	4.70	2.38	−1.447	0.150
Interaction with peers	3.96	2.23	4.36	2.54	−1.561	0.120
Interaction with the English teacher	3.51	2.17	3.91	2.32	−0.990	0.324

of questionnaires and a consent form were distributed online to around eight natural intact classes of first-year undergraduate students enrolled in the English Listening and Speaking course in week 2 (phase 1), which yielded 261 valid questionnaires. The same questionnaires were distributed to the same students again in week 15 (phase 2), which resulted in 193 questionnaires. Then, the two sets of questionnaires were compared and those with no matching in either phase were deleted, leaving 182 sets of complete matching data in both phases for further analyses.

Data Analyses

All the data were analyzed via SPSS 20. The FLCAS and FLLAS were first subjected to rotated (varimax) principal factor analysis in both phases to determine their underlying components. Correlation analyses (Pearson two-tailed) were run to examine the correlations between them. Paired samples *t*-tests were then conducted on FLCAS and FLLAS scales to examine changes in FLCA and listening anxiety in two phases respectively. Finally, multiple regression analyses were run to investigate the effects of FLCA, FLLA and self-rated learning of English on students' self-rated proficiency in English listening and speaking in both phases respectively.

RESULTS

Prior to any statistical analysis, the adapted FLCAS and FLLAS were subjected to rotated (varimax) principal components analysis in both phases, as done in many existing studies (e.g., Liu and Huang, 2011; Zhang, 2013; Liu and Xiangming, 2019; Wang and Cha, 2019) which sometimes reveal different components in different situations.

The analysis of FLCAS yielded seven factors in phase 1 and six factors in phase 2, with all eigenvalues exceeding 1 (see **Appendix Table A1**). Based on these results and those of the reviewed literature, coupled with a careful examination of each FLCAS item, the present study adopted a 6-factor solution on the FLCAS, which was then applied to the analyses of the FLCAS in both phases (**Appendix Table A2**). These six factors were: 12-item FLCAS1 reflective of anxiety about speaking English, nine-item FLCAS2 indicative of worry

about the English class, four-item FLCAS3 suggestive of worry about classroom performance, three-item FLCAS4 concerned about anxiety about not understanding the teacher, three-item FLCAS5 reflective of worry about tests, and two-item FLCAS6 indicating worry about mistakes. With reference to Zhang (2013), the analysis of FLLAS resulted in four factors in both phases (see **Appendix Table A1**): nine-item FLLAS1 reflective of anxiety about listening to English, six-item FLLAS2 suggestive of attitudes toward English listening, three-item FLLAS3 concerned with English listening decoding skills, and two-item FLLAS4 related to English culture in learning listening English.

As shown in **Appendices Table A2**, **A3**, the FLCAS items were highly related to the factors they belonged to, so were the FLLAS items. These FLCAS and FLLAS scales were then used for further analyses in the present study. When computing the scores, items reflective of little/no anxiety about or confidence in speaking or listening to English were reverse-coded. Consequently, the higher the FLCAS/FLLAS score, the more anxious a respondent was about speaking/listening to English.

Changes in Foreign Language Classroom Anxiety and Listening Anxiety

As shown in **Table 2**, the students scored 3.08 to 3.25 in phase 1 and 3.08 to 3.23 in phase 2 on FLCAS scales, higher than the scale midpoint 3, indicating that more than half of the participants were anxious about speaking English (FLCAS1), worried about the English class (FLCAS2) and classroom performance (FLCAS3), anxious about not understanding the teacher (FLCAS4), and worried about tests (FLCAS5) and mistakes (FLCAS6) in both phases. Similarly, they scored 2.89–3.29 in phase 1 and 2.97–3.23 in phase 2 on FLLAS scales, around the scale midpoint 3, meaning that around half of the participants were anxious about listening to English (FLLAS1), held negative attitudes toward English listening and were not satisfied with their English listening proficiency (FLLAS2), were poor in decoding English listening (FLLAS3) and worried about learning English culture in order to learn English listening well (FLLAS4) in both phases.

TABLE 2 | Means, standard deviations, and paired samples *t*-test results of FLCAS and FLLAS scales in both phases (*N* = 182).

	Phase 1		Phase 2		Paired samples *t*-test results	
	Mean	SD	Mean	SD	*t*	*P*
FLCAS1	3.25	0.72	3.18	0.75	1.248	0.213
FLCAS2	3.08	0.65	3.08	0.74	0.518	0.60
FLCAS3	3.18	0.89	3.11	0.92	1.08	0.281
FLCAS4	3.13	0.898	3.08	0.93	1.521	0.130
FLCAS5	3.22	0.85	3.23	0.88	0.094	0.925
FLCAS6	3.24	0.77	3.23	0.92	0.301	0.764
FLCAS	3.18	0.65	3.14	0.71	1.001	0.318
FLLAS1	2.98	0.76	3.01	0.82	0.227	0.821
FLLAS2	3.14	0.62	3.06	0.59	1.63	0.105
FLLAS3	3.29	0.87	3.23	0.94	1.124	0.262
FLLAS4	2.89	0.67	2.97	0.72	−1.306	0.193
FLLAS	3.06	0.60	3.05	0.65	0.676	0.500
Listening	4.11	2.21	4.11	2.18	0.045	0.964
Speaking	3.95	2.16	4.21	2.22	−0.755	0.451

FLCAS1, anxiety about speaking English; FLCAS2, worry about the English class; FLCAS3, worry about classroom performance; FLCAS4, anxiety about not understanding the teacher; FLCAS5, worry about tests; FLCAS6, worry about mistakes; FLCAS, Foreign Language Classroom Anxiety Scale; FLLAS1, anxiety about listening to English; FLLAS2, attitudes toward English listening; FLLAS3, English listening decoding skills; FLLAS4, worry about English culture related to listening English; FLLAS, Foreign Language Listening Anxiety Scale; Listening, self-rated listening proficiency; Speaking, self-rated speaking proficiency.

As seen from **Table 2**, the students tended to score lower or similar on FLCAS and FLLAS scales in phase 2. Nevertheless, no statistically significant differences occurred in any of the scales, as evidenced by paired samples t test results reported in **Table 2**.

Meanwhile, **Table 2** shows that the informants self-rated their English listening proficiency as 4.11 in both phases and English speaking proficiency as 3.95 in phase 1 and 4.21 in phase 2, quite low on the scale of 1 to 10. And no significant increase or decrease in the students' self-rated proficiency in English listening or speaking occurred in phase 2.

Correlations Between FLCAS and FLLAS Scales

As reported in **Table 3**, FLCAS and FLLAS scales were significantly positively related to one another in both phases (*r* = 0.244 ∼0.819 in phase and 0.248 ∼0.826 in phase 2, *p* ≤ 0.002). Alternatively, the higher the FLCAS score, the higher the FLLAS score. For example, the more anxious a respondent was about speaking English (FLCAS1), the more anxious he/she was about listening to English (FLLAS1) (*r* = 0.695 in phase 1 and 0.715 in phase 2).

Effects of FLCA and FLLA on Self-Rated Proficiency in Speaking English

In order to explore the effects of FLCA and FLLA on English speaking proficiency, multiple stepwise regression analyses were conducted three times in both phases respectively, with self-rated English speaking proficiency as the dependent variable,

FLCAS scales as independent variables the first time, FLCAS and FLLAS scales as independent variables the second time, and FLCAS and FLLAS scales and self-rated learning of English as independent variables the third time. The results are summarized in **Tables 4**, **5**.

As shown in **Table 4** (phase 1), when FLCAS scales were used as independent variables, FLCAS (overall FLCA) and FLCAS4 (anxiety about not understanding the teacher) were powerful predictors for self-rated English speaking proficiency, with FLCAS being a negative (β = −0.806, *t* = −11.43, *p* = 0.000) and FLCAS4 a positive (β = 0.307, *t* = 4.36, *p* = 0.000) predictor. When FLCAS and FLLAS scales were used as independent variables, FLCAS, FLCAS4, FLLAS (overall FLLA) and FLLAS4 (worry about English culture related to listening English) were powerful predictors for self-rated English speaking proficiency. FLCAS (β = −0.557, *t* = −6.11, *p* = 0.000) and FLLAS (β = −0.388, *t* = −4.23, *p* = 0.000) were negative predictors while FLCAS4 (β = 0.341, *t* = 4.81, *p* = 0.000) and FLLAS4 (β = 0.132, *t* = 2.36, *p* = 0.019) were positive predictors. When FLCAS and FLLAS scales and self-rated learning of English were used as independent variables, confidence in using English (β = 0.452, *t* = 7.23, *p* = 0.000), FLLAS (β = −0.312, *t* = −4.24, *p* = 0.000), efforts to learn English (β = 0.137, *t* = 2.83, *p* = 0.005), FLLAS4 (β = 0.122, *t* = 2.59, *p* = 0.01), FLCAS4 (β = 0.164, *t* = 2.88, *p* = 0.004), and FLCAS1 (anxiety about speaking English) (β = −0.152, *t* = −2.20, *p* = 0.029) proved to be powerful predictors for self-rated English speaking proficiency.

As reported in **Table 5**, when FLCAS scales were used as independent variables, FLCAS (β = −0.503, *t* = −7.80, *p* = 0.000) was a powerful negative predictor for self-rated English speaking proficiency. When FLCAS and FLLAS scales were used as independent variables, FLCAS (β = −0.465, *t* = −4.20, *p* = 0.000), FLLAS2 (attitudes toward English listening) (β = −0.391, *t* = −3.95, *p* = 0.000), and FLLAS (β = 0.274, *t* = 2.12, *p* = 0.035) were powerful predictors for self-rated English speaking proficiency. FLCAS and FLLAS2 were negative predictors while FLLAS was a positive one. When FLCAS and FLLAS scales and self-rated learning of English were used as independent variables, interaction with the course instructor (β = 0.361, *t* = 5.68, *p* = 0.000), FLCAS (β = −0.248, *t* = −3.13, *p* = 0.002), and FLLAS2 (β = −0.184, *t* = −2.29, *p* = 0.023) proved to be powerful predictors for self-rated English speaking proficiency.

Effects of FLCA and FLLA on Self-Rated Proficiency in Listening English

In order to explore the effects of FLCA and FLLA on English listening proficiency, multiple stepwise regression analyses were conducted three times in both phases respectively, with self-rated English listening proficiency as the dependent variable, FLLAS scales as independent variables the first time, FLLAS and FLCAS scales as independent variables the second time, and FLLAS and FLCAS scales and self-rated learning of English as independent variables the third time. The results are summarized in **Tables 6**, **7**.

As shown in **Table 6**, when FLLAS scales were used as independent variables, FLLAS (β = −1.103, *t* = −7.02, *p* = 0.000),

TABLE 3 | Correlations between FLCAS and FLLAS scales in both phases (*N* = 182).

	FLLAS1	FLLAS2	FLLAS3	FLLAS4	FLLAS
FLCAS1	0.695**/0.715**	0.611**/0.599**	0.599**/0.613**	0.314**/0.266**	0.749**/0.738**
FLCAS2	0.669**/0.684**	0.638**/0.723**	0.600**/0.651**	0.244**/0.274**	0.735**/0.763**
FLCAS3	0.691**/0.733**	0.591**/0.581**	0.590**/0.662**	0.297**/0.441**	0.737**/0.773**
FLCAS4	0.703**/0.705**	0.397**/0.442**	0.540**/0.609**	0.386**/0.224**	0.682**/0.683**
FLCAS5	0.588**/0.643**	0.522**/0.538**	0.558**/0.650**	0.277**/0.375**	0.648**/0.700**
FLCAS6	0.450**/0.484**	0.415**/0.424**	0.394**/0.408**	0.209**/0.248**	0.493**/0.511**
FLCAS	0.765**/0.782**	0.657**/0.676**	0.663**/0.705**	0.337**/0.339**	0.819**/0.826**

The first number refers to the coefficient in phase 1 and second refers to the coefficient in phase 2.
**p ≤ 0.002; coefficient of determination: small = r ≤ 0.1; medium = r = 0.3; large = r ≥ 0.5 (Cohen, 1988).

TABLE 4 | Multiple regression coefficients and significance of predictors for speaking English proficiency (phase 1).

		FLCAS	FLCAS4
Speaking: FLCAS as independent variables	β	−0.806	0.307
	t	−11.43**	4.36**
	p	0.000	0.000
	VIF	2.09	2.09
	Cohen's f^2	0.12	0.045

		FLCAS	FLCAS4	FLLAS	FLLAS4
Speaking: FLCAS and FLLAS as independent variables	β	−0.557	0.341	−0.388	0.132
	t	−6.11**	4.81**	−4.23**	2.36*
	p	0.000	0.000	0.000	0.019
	VIF	3.72	2.25	3.768	1.392
	Cohen's f^2	0.12	0.045	0.029	0.012

		Confidence in using English	FLLAS	Efforts to learn English	FLLAS4	FLCAS4	FLCAS1
Speaking: All variables as independent variables	β	0.452	−0.312	0.137	0.122	0.164	−0.152
	t	7.23**	−4.24**	2.83**	2.59**	2.88**	−2.20*
	p	0.000	0.000	0.005	0.01	0.004	0.029
	VIF	2.43	3.369	1.459	1.373	2.015	2.95
	Cohen's f^2	0.27	0.026	0.013	0.014	0.009	0.008

**p ≤ 0.01; *p ≤ 0.05.
Effect size of Cohen's f^2: small = f^2 ≤ 0.02; medium = f^2 = 0.15; large = f^2 ≥ 0.35 (Cohen, 1988).

FLLAS4 (β = 0.236, *t* = 3.93, *p* = 0.000), and FLLAS1 (anxiety about listening to English) were (β = 0.508, *t* = 3.38, *p* = 0.001) powerful predictors for self-rated English listening proficiency, with FLLAS being a negative and the latter two positive predictors. When FLLAS and FLCAS scales were used as independent variables, FLLAS, FLLAS4, FLLAS1, and FLCAS3 (worry about classroom performance) were powerful predictors for self-rated English listening proficiency. FLLAS (β = −0.922, *t* = −5.53, *p* = 0.000) and FLCAS3 (β = −0.220, *t* = −2.91, *p* = 0.004) were negative predictors while FLLAS4 (β = 0.214, *t* = 3.59, *p* = 0.000) and FLLAS1 (β = 0.500, *t* = 3.37, *p* = 0.001) were positive predictors. When FLLAS and FLCAS scales and self-rated learning of English were used as independent variables, confidence in using English (β = 0.464, *t* = 7.78, *p* = 0.000), FLLAS3 (English listening decoding skills) (β = −0.164, *t* = −2.92, *p* = 0.004), and FLLAS2 (β = −0.145, *t* = −2.38,

p = 0.018) proved to be powerful predictors for self-rated English listening proficiency.

As reported in **Table 7**, when FLLAS scales were used as independent variables, FLLAS2 (β = −0.483, *t* = −6.61, *p* = 0.000) and FLLAS3 (β = −0.137, *t* = −2.004, *p* = 0.047) were powerful negative predictors for self-rated English listening proficiency. When FLLAS and FLCAS scales were used as independent variables, FLLAS2 (β = −0.441, *t* = −5.95, *p* = 0.000) and FLCAS3 (β = −0.212, *t* = −2.85, *p* = 0.005) were powerful negative predictors for self-rated English listening proficiency. When FLLAS and FLCAS scales and self-rated learning of English were used as independent variables, FLLAS2 (β = −0.259, *t* = −3.46, *p* = 0.001), motivation to learn English (β = 0.275, *t* = 4.36, *p* = 0.000), interaction with peers (β = 0.190, *t* = 3.12, *p* = 0.002), and FLCAS3 (β = −0.192, *t* = −2.81, *p* = 0.006) were powerful predictors for self-rated English listening proficiency. FLLAS2

TABLE 5 | Multiple regression coefficients and significance of predictors for speaking English proficiency (phase 2).

		FLCAS		
Speaking: FLCAS as independent variables	β	−0.503		
	t	−7.80**		
	p	0.000		
	VIF	1.000		
	Cohen's f^2	0.064		
		FLCAS	**FLLAS2**	**FLLAS**
Speaking: FLCAS and FLLAS as independent variables	β	−0.465	−0.391	0.274
	t	−4.20**	−3.95**	2.12*
	p	0.000	0.000	0.035
	VIF	3.172	2.536	0.432
	Cohen's f^2	0.064	0.043	0.017
		Interaction with instructor	**FLCAS**	**FLLAS2**
Speaking: All variables as independent variables	β	0.361	−0.248	−0.184
	t	5.68**	−3.13**	−2.29*
	p	0.000	0.002	0.023
	VIF	1.203	1.881	1.929
	Cohen's f^2	0.074	0.114	0.018

$**p \leq 0.01$; $*p \leq 0.05$.
Effect size of Cohen's f^2: small $= f^2 \leq 0.02$; medium $= f^2 = 0.15$; large $= f^2 \geq 0.35$ (Cohen, 1988).

TABLE 6 | Multiple regression coefficients and significance of predictors for listening English proficiency (phase 1).

		FLLAS	FLLAS4	FLLAS1	
Listening: FLLAS as independent variables	β	−1.103	0.236	0.508	
	t	−7.02**	3.93**	3.38**	
	p	0.000	0.000	0.001	
	VIF	9.33	1.36	8.54	
	Cohen's f^2	0.067	0.032	0.30	
		FLLAS	**FLLAS4**	**FLLAS1**	**FLCAS3**
Listening: FLLAS and FLCAS as independent variables	β	−0.922	0.214	0.500	−0.220
	t	−5.53**	3.59**	3.37**	−2.91**
	p	0.000	0.000	0.001	0.004
	VIF	10.83	1.39	8.55	2.22
	Cohen's f^2	0.067	0.032	0.030	0.022
		Confidence in using English	**FLLAS3**	**FLLAS2**	
Listening: All variables as independent variables	β	0.464	−0.164	−0.145	
	t	7.78**	−2.92**	−2.38*	
	p	0.000	0.004	0.018	
	VIF	1.63	1.46	1.70	
	Cohen's f^2	0.15	0.033	0.012	

$**p \leq 0.01$; $*p \leq 0.05$.
Effect size of Cohen's f^2: small $= f^2 \leq 0.02$; medium $= f^2 = 0.15$; large $= f^2 \geq 0.35$ (Cohen, 1988).

and FLCAS3 were negative while motivation to learn English and interaction with peers were positive predictors.

DISCUSSION

The present study revealed that both the FLCAS and the FLLAS had underlying components, were highly reliable and significantly positively correlated with each other.

Changes in Foreign Language Classroom Anxiety and Listening Anxiety

Statistical analyses showed that the students experienced a quite high level of FLCA, higher than did their peers in traditional classrooms in Liu's studies (Liu, 2006, 2016; Liu and Jackson, 2008; Liu and Xiangming, 2019). Their anxiety was also greater than that experienced by distance learners in Hurd and Xiao (2010), which might be because the participants in the present study were new to the university and the learning environment while those in the latter were not. In addition, the participants in the present study suffered from high FLLA, also higher than did their peers in traditional classrooms in Liu (2016). These findings might be because the participants, as newcomers to the university, were not accustomed to the new environment at the beginning of the semester and still did not adapt themselves to the pandemic online learning context during the semester, where they could not turn to their peers and teachers as easily as in traditional classrooms, as reported in Hurd (2007) and

Kaisar and Chowdhury (2020). However, as discussed in Gong et al. (2020a,b, 2021) and Scull et al. (2020), interaction between students and instructors as well as with others is crucial in successfully learning a second/foreign language. This is especially important for online teaching in facilitating and supporting the learning process (Bryson and Andres, 2020). As reported in Coman et al. (2020), lack of interaction was a big problem faced by Romanian university students when teaching became online due to COVID-19. In order to help students learn online better due to the COVID-19 pandemic, teachers in Scull et al. (2020) made efforts to ensure that materials were accessible and responsive to students' needs, strengthen students' participation through building relationships and connecting with them, and engage students socially and intellectually. Naturally, these efforts led to good results.

Due to the lack of interaction, the participants might not feel confident and comfortable when learning and using English, as discussed in Chen (2010) and O'Doherty et al. (2018). Another possible reason was that because of the precautions against COVID-19, students could not access libraries as much as they could, nor could they communicate with peers or teachers as much as possible or as easily as they did in normal school learning situations, as reported by the participants in the present study. They even could not easily search for resources on Internet due to various reasons such as cost, instability of the Internet, and so on. All these might have (greatly) hindered them from knowing one another and building a sense of belonging and community. Thus, they were not familiar with their peers, not

TABLE 7 | Multiple regression coefficients and significance of predictors for listening English proficiency (phase 2).

		FLLAS2	FLLAS3
Listening: FLLAS as independent variables	β	−0.483	−0.147
	t	−6.61**	−2.004*
	p	0.000	0.047
	VIF	1.437	1.437
	Cohen's f^2	0.101	0.015

		FLLAS2	FLCAS3
Listening: FLLAS and FLCAS as independent variables	β	−0.441	−0.212
	t	−5.95**	−2.85**
	p	0.000	0.005
	VIF	1.510	1.510
	Cohen's f^2	0.101	0.030

		FLLAS2	Motivation to learn English	Interaction with peers	FLCAS3
Listening: All variables as independent variables	β	−0.259	0.275	0.190	−0.192
	t	−3.46**	4.36**	3.12**	−2.81**
	p	0.001	0.000	0.002	0.006
	VIF	1.823	1.288	1.199	1.515
	Cohen's f^2	0.101	0.078	0.033	0.024

**p ≤ 0.01; *p ≤ 0.05.
Effect size of Cohen's f^2: small = f^2 ≤ 0.02; medium = f^2 = 0.15; large = f^2 ≥ 0.35 (Cohen, 1988).

easy to communicate with others in English or look for help with their English learning, not confident in using English, not interested in learning or motivated to learn English, as discussed in the current literature (Lei and Gupta, 2010; De Paepe et al., 2018; Janse van Rensburg, 2018). They did not make much effort to learn English either, had not much interaction with their peers and instructors, and self-rated their proficiency in listening and speaking English rather low, as reported in **Tables 1**, **2**, both at the beginning and end of the semester. As a result, in both phases, they were apprehensive of speaking and listening to English in class, worried about the English class and classroom performance, were afraid of mistakes and English tests, were not satisfied with their English listening proficiency and tried to translate word by word when listening to English, and were upset by the culture they had to learn to understand spoken English.

All these reasons also largely explained why the participants' levels of FLCA and listening anxiety generally remained unchanged over the 16-week semester, similar to Hurd's (2007) study of online learners of French but different from those of learners in traditional classrooms (Gregersen et al., 2014; Kruk, 2018; Liu and Xiangming, 2019; Xiangming et al., 2020). Although this result might partially be due to the fact that relatively a small number of students answered the questionnaires, it indicated that the learning environment was crucial to the levels of and changes in FLCA and FLLA, also

evidenced in Gong et al. (2020a,b, 2021) studies in the study-abroad context and those in online or traditional classrooms previously reviewed. Namely, a learning environment facilitates learning if it provides adequate resources and opportunities for students to learn and practice the target language and develop themselves (e.g., building self-confidence, and developing communication skills, etc.) in various ways. However, if learners cannot have more access to and practice of the target language, have little chance of getting familiarized with their peers and course instructors, and have difficulty in getting help for their learning of the target language, they are likely to experience the same level of FLCA and listening anxiety during a long period in the same context.

Effects of FLCA and FLLA on Self-Rated Proficiency in Speaking and Listening English

In both phases, whether working alone or working with FLLAS scales, FLCAS (overall foreign language anxiety) remained a powerful negative predictor for self-rated speaking English proficiency. FLCAS4 (worry about not understanding the teacher) was a powerful positive predictor in phase 1. When different variables worked together, FLLAS (overall FLLA) remained a powerful negative predictor in all cases in both phases, FLLAS4 (worry about English culture related to listening English) a negative predictor in phase 1 and FLLAS2 (attitudes toward English listening) a negative predictor in phase 2. These findings clearly indicated that FLCA (overall FLCA and anxiety about speaking English) and FLLA greatly affected students' self-perceived proficiency in speaking English, as found in Liu (2018) and Liu and Xiangming (2019). In particular, incomprehensible input (i.e., not understanding the teacher or the culture related to speaking English) and attitudes toward English listening had special impacts on students' self-perceived proficiency in speaking English, as discussed in Bailey (1983), Horwitz et al. (1986), and Liu (2006). In addition, confidence in using English, efforts to learn English and interaction with the course instructor mediated FLCAS and FLLAS scales to exert effects on students' self-perceived proficiency in speaking English, as reported by learners in Bailey (1983), Liu (2006), Bekleyen (2009), and Jee (2016).

Whether working alone or working with other variables, FLLAS (overall FLLA) and/or its subscales significantly predicted students' self-rated listening English proficiency in all cases in both phases. FLCAS3 (worry about classroom performance) powerfully negatively predicted the latter in both phases. These findings suggest that FLLA (FLLA, negative attitudes toward English learning and poor English listening skills) and worry about classroom performance (FLCAS3) are powerful predictors for students' self-rated listening English proficiency, as found in Elkhafaifi (2005) and Liu (2016). When different variables worked together, FLLAS1 (worry about English listening) became a positive predictor, indicating that anxiety might facilitate second/foreign language learning to a certain degree, as found in Bailey (1983) and Liu (2006). Moreover, confidence in using English, motivation to learn English and interaction with peers

mediated FLCAS and FLLAS scales to exert effects on students' self-perceived proficiency in listening English, as discussed in Elkhafaifi (2005) and Botes et al. (2020).

Clearly, FLCA and FLLA affected students' self-perceived proficiency in listening and speaking English respectively. Moreover, FLLA seemed to have a greater effect on self-rated proficiency in speaking English than did FLCA on self-rated proficiency in listening English.

CONCLUSION AND IMPLICATIONS

The present study investigated changes in and effects of FLCA and listening anxiety on Chinese undergraduate students' English proficiency over a semester in the COVID-19 context. Analyses of a set of 182 matching questionnaires revealed the following major findings: (1) the respondents reported a similarly high level of FLCA and FLLA both at the beginning and end of the semester, (2) FLCAS and FLLAS scales were highly positively related to one another, (3) FLCA and FLLA significantly predicted the respondents' self-rated proficiency in listening and speaking English. FLLA seemed to have a greater effect on self-rated proficiency in speaking English than did FLCA on self-rated proficiency in listening English, and (4) confidence in using English, efforts and motivation to learn English and interaction with the English instructor and peers mediated FLCAS and FLLAS scales to affect the participants' self-rated proficiency in listening and speaking English.

Although the relatively small number of respondents might weaken the generalizability of the findings in the present study, these findings clearly show that the learning environment is critical in influencing the levels of and changes in FLCA and FLLA and that FLCA and FLLA are serious issues in the COVID-19 foreign language learning context. As reported in many current studies (Bailey, 1983; Horwitz et al., 1986; Elkhafaifi, 2005; Liu, 2006, 2018; Liu and Xiangming, 2019), as students have more access to and practice of the target language, become more familiar with their peers, the course instructor and the classroom and school learning environment, they often become more confident and less anxious when using the target language in class. However, due to the fast and widespread of COVID-19, the participants in the present study had limited access to and practice of speaking and listening to English, were distant from their peers and course instructors, and could not resort to many resources from the Internet and school libraries, during the whole semester. Thus, they suffered from quite high levels of FLCA and FLLA both at the beginning and end of the semester, which did not show any significant change. Consequently, how to help reduce students' FLCA and FLLA levels in the pandemic language learning context is a significant issue. On the part of language instructors, it is useful for them to give a clear description of the course, including requirements, expectations, content, tasks, assessment in relation to the COVID-19 context at the beginning of a semester (Kruk, 2018). This could help relieve students' worry about the course and the unpredictable new context to a certain degree. During the semester, it is important for instructors to encourage students to speak English to one another and listen to English as much as possible both in and outside the online/traditional classroom. Course instructors had better try all means to build a friendly and supportive classroom atmosphere to help students feel at ease when using English in class, as discussed in the current literature (e.g., Horwitz et al., 1986; Phillips, 1992; Golchi, 2012; Liu, 2018; Liu and Xiangming, 2019). For example, in the listening English class, teachers can first understand students' listening proficiency level, provide them with comprehensible input to let them experience small success and to boost their confidence, and then offer materials with increasing difficulties (Elkhafaifi, 2005). In addition, as suggested by Oxford (2008), listening instructions can focus on specific listening strategies (e.g., listening to key words, paying attention to word stress) to improve students' listening skills and on specific positive feedback to increase students' positive learning experiences and to cultivate their positive attitudes toward foreign language listening class.

Meanwhile, as found in MacIntyre et al. (2020) large-scale survey study, language teachers are also new to and under great stress in this unexpected CONVID-19 pandemic. Thus, it is better for them to spend more time planning and preparing their lessons and reflect their teaching practices and adjust them timely to cater to the new teaching and learning experience imposed by COVID-19, as did Bryson and Andres (2020). To facilitate teaching and help students, it is necessary for teachers to provide both synchronous and asynchronous learning opportunities (Bryson and Andres, 2020; Scull et al., 2020). It is also helpful for them to provide emotional, technical and instructional support for students, actively interact with students and seek support for teaching and learning (Bryson and Andres, 2020; MacIntyre et al., 2020). All these can be easily realized by building relationships and connections via Wechat, email, and blogs as well as classroom interactions.

In addition to actively interacting with their peers and course instructors and engaging themselves in all classroom activities, students themselves should make use of all resources they can find to increase their exposure to and use of English, such as BBC and VOA news, Ted talks and TV episodes (Zhang, 2013; Liu and Xiangming, 2019; Wang and Cha, 2019). Autonomous learning and active responses to the unexpected pandemic are always beneficial. This is best demonstrated by adult New Zealanders learning Chinese as a second language in China in Gong et al. (2020a, 2021), who made strategic efforts to seek opportunities and resources for practicing spoken Chinese outside the classroom. All these efforts can not only help reduce their FLCA and FLLA levels but also improve their proficiency in overall English as well as speaking and listening English. Then, a beneficial circle may form: Lower FLCA and FLLA lead to higher proficiency in speaking and listening English, and vice versa.

The present study enriched the current literature on foreign language anxiety by examining changes in and effects of FLCA and FLLA at different time points in the COVID-19 context. Even so, it can be bettered in several ways. First, the participants in the present study were homogeneous and the sample size was relatively small, which might make the

findings less generalizable. Future studies can recruit more participants from diverse populations and thus present a fuller profile of anxiety in pandemic online learning contexts. Second, a deeper understanding of foreign language anxiety in online and traditional learning classrooms can be achieved if future studies can simultaneously cover both situations with triangulated data. The results may lend further support to the finding in Côté and Gaffney (2018) that online learners felt significantly less anxious than those in traditional classrooms. The results may also help identify sources for anxiety in pandemic online learning contexts.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Research Committee of the Department of Foreign Languages and Literatures, Tsinghua University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ML contributed to conception and design of the study, performed the statistical analysis, and wrote sections of the manuscript. RY organized the database and wrote sections of the manuscript. Both authors contributed to the manuscript revision, read, and approved the submitted version.

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APPENDIX

TABLE A1 | Eigenvalues and explained variances of FLCAS and FLLAS factors.

	Phase 1		Phase 2	
	Eigenvalue	% of total variance	Eigenvalue	% of total variance
FLCAS1	4.199	12.52%	5.853	17.74%
FLCAS2	4.075	12.45%;	4.365	13.23%
FLCAS3	3.319	11.48%	4.284	12.98%
FLCAS4	2.732	9.91%	2.858	8.66%
FLCAS5	2.632	5.20%	1.778	5.39%
FLCAS6	2.007	4.99%	1.667	5.05%
FLCAS7	1.452	3.98%		
FLLAS1			5.597	27.98%
FLLAS2			2.642	13.21%
FLLAS3			1.964	9.82%
FLLAS4			1.753	8.76%

TABLE A2 | Loadings of principal components of FLCAS (phases 1/2) [Kaiser–Meyer–Olkin (KMO) = 0.942 in phase 1 and 0.921 in phase 2 ($p \leq 0.001$)].

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
(1) I never feel quite sure of myself when I am speaking English in my class.	**0.376/0.254**	0.215/0.574	0.524/−0.359	0.126/0.376	0.200/0.029	0.175/−0.103
(2) I don't worry about making mistakes in the English class.	−0.253/−0.134	−0.022/−0.431	−0.642/0.568	−0.034/−0.011	0.034/−0.008	**0.066/−0.108**
(3) I tremble when I know that I'm going to be called on in the English class.	**0.724/0.355**	0.085/0.644	0.323/−0.314	−0.076/0.152	0.140/0.053	0.020/−0.037
(4) It frightens me when I don't understand what the teacher is saying in English.	0.361/0.401	0.580/0.379	0.183/−0.295	**0.093/0.213**	0.055/0.328	−0.035/−0.085
(5) It wouldn't bother me at all to take more foreign language classes.	−0.060/−0.160	**−0.108/−0.146**	−0.656/0.619	−0.170/−0.223	−0.108/0.009	0.031/0.034
(6) During my English class, I find myself thinking about things that have nothing to do with the course.	0.064/0.212	**0.005/0.071**	−0.030/−0.085	0.067/0.141	0.142/0.185	0.792/0.726
(7) I keep thinking that the other students are better at English than I am.	0.266/0.310	0.328/0.185	**0.480/−0.282**	0.052/0.698	0.518/0.012	0.268/0.217
(8) I am usually at ease during English tests in my class.	−0.247/−0.309	−0.350/−0.041	−0.602/0.634	−0.097/−0.330	**−0.157/−0.204**	0.002/0.065
(9) I start to panic when I have to speak without preparation in the English class.	**0.553/0.113**	0.225/0.554	0.231/−0.173	0.258/0.505	0.279/0.217	−0.123/0.000
(10) I worry about the consequences of failing my English class.	0.172/0.271	0.530/0.176	0.234/−0.200	0.100/0.601	**0.368/0.314**	−0.043/−0.040
(11) I don't understand why some people get so upset over English classes.	−0.198/−0.369	**−0.219/0.027**	−0.588/0.599	−0.087/−0.071	−0.058/0.038	0.034/0.098
(12) In the English class, I can get so nervous I forget things I know.	0.547/0.355	**0.392/0.228**	0.110/−0.120	0.126/0.319	0.101/0.531	0.026/0.263
(13) It embarrasses me to volunteer answers in my English class.	**0.656/0.357**	0.081/0.637	0.122/−0.134	0.186/0.060	0.089/0.270	0.192/0.053
(14) I would not be nervous speaking English with native speakers.	**−0.152/−0.158**	−0.106/−0.101	−0.404/0.653	−0.585/0.040	−0.030/−0.402	−0.040/0.119
(15) I get upset when I don't understand what the teacher is correcting.	0.169/0.227	0.686/0.397	0.114/−0.076	**0.284/0.126**	0.079/0.489	−0.040/0.127

(Continued)

TABLE A2 | Continued

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
(16) Even if I am well prepared for the English class, I feel anxious about it.	0.604/0.579	**0.225/0.413**	0.289/–0.151	0.101/0.109	0.027/0.247	0.177/0.209
(17) I often feel like not going to my English class.	0.266/0.617	**0.415/0.206**	0.233/–0.176	0.008/–0.187	–0.254/0.144	0.504/0.432
(18) I feel confident when I speak English in class.	**–0.353/–0.158**	–0.264/–0.156	–0.515/0.673	–0.245/–0.220	–0.226/–0.058	–0.117/0.034
(19) I am afraid that my English teacher is ready to correct every mistake I make.	0.582/0.310	0.229/0.311	0.129/–0.016	0.140/–0.059	–0.175/0.585	**–0.062/0.087**
(20) I can feel my heart pounding when I'm going to be called on in the English class.	**0.685/0.216**	0.116/0.798	0.162/–0.066	0.095/–0.046	0.299/0.162	–0.101/0.140
(21) The more I study for an English test, the more confused I get.	0.318/0.535	0.470/0.222	0.172/0.024	–0.017/0.356	**0.166/0.020**	0.198/0.311
(22) I don't feel pressure to prepare very well for the English class.	–0.146/–0.127	**–0.319/0.018**	–0.624/0.618	–0.108/–0.286	–0.363/0.130	–0.006/–0.313
(23) I always feel that the other students speak English better than I do.	0.320/0.305	0.306/0.348	**0.366/–0.255**	0.064/0.654	0.557/0.213	0.245/0.104
(24) I feel very self-conscious about speaking English in front of other students.	**0.688/0.291**	0.305/0.529	0.258/–0.201	0.028/0.215	–0.005/0.347	0.139/0.092
(25) The English class moves so quickly I worry about getting left behind.	0.254/0.679	0.537/0.271	**0.364/–0.154**	–0.034/0.225	0.229/0.186	0.200/0.077
(26) I feel more tense and nervous in my English class than in my other classes.	0.411/0.771	**0.461/0.315**	0.453/–0.196	–0.106/0.177	–0.178/0.068	0.098/–0.045
(27) I get nervous and confused when I am speaking English in class.	**0.638/0.641**	0.403/0.329	0.262/–0.215	–0.006/0.226	–0.031/0.220	0.257/0.056
(28) When I'm on my way to the English class, I feel very sure and relaxed.	–0.214/–0.274	**–0.113/–0.149**	–0.667/0.727	–0.162/–0.014	–0.000/–0.060	–0.247/–0.178
(29) I get nervous when I don't understand every word the English teacher says.	0.201/0.532	0.712/0.114	0.103/–0.060	**0.130/0.301**	–0.044/0.491	–0.073/–0.338
(30) I feel overwhelmed by the number of rules I have to learn to speak English.	**0.218/0.632**	0.687/0.163	0.098/–0.162	0.104/0.310	0.027/0.262	0.214/0.072
(31) I am afraid that the other students will laugh at me when I speak English.	0.555/0.493	0.348/0.325	**0.204/–0.161**	0.062/0.121	0.040/0.414	0.104/0.161
(32) I would probably feel comfortable around native speakers of English.	**0.029/0.182**	–0.098/–0.169	–0.508/0.693	–0.602/0.066	0.125/–0.127	–0.083/–0.181
(33) I get nervous when the English teacher asks questions which I haven't prepared in advance.	**0.560/0.264**	0.249/0.668	0.076/–0.020	0.313/0.167	0.300/0.197	–0.067/0.036

Loadings of items included in corresponding factors are in bold.

TABLE A3 | Loadings of principal components of FLLAS (phases 1/2) [KMO = 0.915 in phase 1 and 0.895 in phase 2 ($p \leq 0.001$)].

	Factor 1	Factor 2	Factor 3	Factor 4
(37) I get upset when I'm not sure whether I understand what I'm hearing in English.	**0.720/0.630**	–0.118/0.297	0.147/0.254	–0.076/0.082
(38) When I listen to English, I often understand the words but still can't quite understand what the speaker is saying.	**0.435/0.309**	–0.124/0.190	0.416/0.602	0.299/0.098
(39) When I'm listening to English, I get so confused I can't remember what I've heard.	0.583/0.678	–0.197/0.231	**0.367/0.289**	0.178/0.081
(40) I feel intimidated whenever I have a listening passage in English to listen to.	**0.688/0.790**	–0.268/0.174	0.098/0.119	0.113/–0.140
(41) I am nervous when I am listening to a passage in English when I'm not familiar with the topic.	**0.752/0.642**	–0.125/0.432	0.235/0.023	–0.004/0.192
(42) I get upset whenever I hear unknown grammar while listening to English.	**0.808/0.729**	–0.058/0.170	0.065/0.252	0.147/–0.066
(43) When listening to English I get nervous and confused when I don't understand every word.	**0.761/0.750**	–0.129/0.146	0.048/0.101	0.049/0.053

(Continued)

TABLE A3 | Continued

	Factor 1	Factor 2	Factor 3	Factor 4
(44) It bothers me to encounter words I can't pronounce while listening to English.	**0.738/0.676**	−0.093/0.357	0.139/0.161	0.074/0.015
(45) I usually end up translating word by word when I'm listening to English.	0.464/0.433	−0.197/0.234	**0.352/0.487**	0.131/0.085
(46) By the time you get past the strange sounds in English, it's hard to remember what you're listening to.	0.431/0.493	−0.191/0.467	**0.554/0.330**	−0.095/0.296
(47) I am worried about all the new sounds you have to learn to understand spoken English.	**0.460/0.689**	−0.318/0.178	0.340/0.244	0.251/−0.201
(48) I enjoy listening to English.	−0.127/−0.261	**0.734/−0.567**	−0.118/−0.183	−0.222/0.495
(49) I feel confident when I am listening to English.	−0.229/−0.218	**0.774/−0.752**	−0.266/−0.184	−0.006/0.296
(50) Once you get used to it, listening to English is not so difficult.	−0.252/−0.067	**0.759/−0.329**	0.112/−0.204	−0.056/0.716
(51) The hardest part of learning English is learning to understand spoken English.	−0.021/0.505	**−0.038/0.013**	0.741/−0.117	0.243/0.358
(52) I would be happy just to learn to read English rather than having to learn to understand spoken English.	0.192/0.560	**−0.060/−0.355**	0.235/0.164	0.752/−0.010
(53) I don't mind listening to English by myself but I feel very uncomfortable when I have to listen to English in a group.	**0.526/0.614**	−0.123/0.111	0.043/0.102	0.187/0.182
(54) I am satisfied with the level of listening comprehension in English that I have achieved so far.	−0.192/−0.216	**0.545/−0.787**	−0.416/−0.007	0.306/−0.016
(55) English culture and ideas seem very foreign to me.	0.389/0.075	−0.327/−0.056	−0.097/0.856	**0.407/−0.171**
(56) You have to know so much about English history and culture in order to understand spoken English.	0.272/0.190	0.380/0.098	0.403/0.201	**−0.264/0.704**

Loadings of items included in corresponding factors are in bold.

Effective Teaching Practices for Success During COVID 19 Pandemic: Towards Phygital Learning

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Following the outbreak of COVID 19 in February 2020, Indian universities were shut down and used digital platforms to teach their students since then. Drawing from Kolb's Learning Theory, John Dewey's theory, Jack Mezirows transformative learning theory, and Jean Piaget's theory, the authors in this paper offer a viewpoint on some of the practical teaching practices which can be adapted in business schools in India to be successful in this emerging blended or phygital environment. Using a Community of Inquiry (CoI) framework, the authors reflect on the effective teaching practices based on their own experience, theoretical knowledge gained from an exhaustive web search of various databases of the period, particularly from February to August 2020. The authors performed a careful manual content analysis of the selected research papers. They concluded seven principal teaching methods to create an effective blended environment for students and faculties in Indian business schools: a) reframing virtual spaces in India through online knowledge repository and virtual labs b) using reflective thinking for andragogical and pedagogical Indian approach c) Indian teachers' readiness to offer various genres of courses on demand d) reinforcing resilience in Indian schools through meaningful participation and conflict resolution e) purposeful learning and inquiry-based learning for Indian students f) experiential learning through an inclusive online pivot in India g) useful apps are discussed to reach out to Indian parents community. These initiatives can influence academicians, educationists, podcasters, and the entire teacher fraternity to design an efficient and adequate teaching plan for the student community in India.

Keywords: digital learning, experiential learning, effective teaching methods, blended learning, phygital learning, reinforcing resilience, business schools, COVID 19 pandemic

INTRODUCTION

COVID 19 is an infectious disease caused by a newly discovered virus, "Novel Corona Virus" (Dhawan, 2020). This virus has now become an unparalleled worldwide sensation due to three major reasons: widespread contamination of elevated mortality rate and considerable delay in the formulation of the vaccine. All this has led the government to implement mammoth measures (Chaturvedi et al., 2020). Great efforts are in place to ensure social and physical distancing by convincing the public to stay at home. These endeavors are primarily directed to break the infection chain and ensure a reduced burden on the civic-health machinery. While the onus of all the trouble was laid on the medical facilities, the changes that have been adopted are massive. This has resulted in

subsequent commercial and communal defeats. The consequential fiscal and communal exercise of social distancing has led to some major policy changes in the functioning of higher education guided towards "online pivot" (George, 2020). For the first time in the history of the Indian education system, there has been a shift from a face-to-face teaching model to a completely online one (Zimmerman, 2020). The extensive use of digital media is in place. Teachers across the section of the society variably or invariably have had to quickly get used to the online mode of teaching guided towards a digital mindset (Victoria, 2020). The student community is also deeply affected. They have had to let go of their campus life, stay indoors, and attend online classes (Chaturvedi and Pasipanodya, 2019; Govindarajan and Srivastava, 2020). Some researchers believe that students who adopt an online learning mode are slightly more receptive than those who "prefer to learn in a traditional face-to-face environment." However, some other researchers proved that the blended teaching mode yields the best results (Means et al., 2013). The teaching community remains cynical about the success of online teaching and learning pattern. A study conducted on complete reliance on online mode of teaching based on the Technology Acceptance Model (Davis, 1989) has revealed that students and faculty share common concerns regarding the availability of the Internet, student-teacher engagement, and incessant workload (Wingo et al., 2017). In line with this, the Unified Technology Acceptance and System Success (UTASS) model was proposed, which said that system quality, social influence, and facilitating conditions positively impact students' behavioral intention towards e-learning systems (Chaturvedi et al., 2018; Zhang et al., 2020). Fundamentally speaking, the entire student and teacher community must bridge a gap quickly from the offline mode of teaching to complete online mode. This is without a choice for either of them as large sums of money are involved. All this has taken a huge toll on the admissions of students in the Universities. The future of educational institutes remains erratic as the government is unable to arrive at any concrete decision. Despite all these uncertainties, university finances are further affected because of the unstable stock market, reduced or no grants from government bodies. Several small and medium-sized private institutions would be worst affected and eventually close due to the tumultuous finances. Higher education remains the most affected. Meanwhile, Business Schools are also not far from being affected by this pandemic. Some industries have immediately come under the spell of COVID 19, such as all the service sectors. Students who intend to make their careers in these sectors are now compelled to shift their focus to other sectors. The government is doing its best to help the economy, and people recover from this crisis (Bolaran, 2020). However, the fact remains, organizations and sectors that can successfully transform themselves from a physical model of operations to online would be the only ones to survive this crisis. To serve all these needs, the organizations need to turn to a blended model of education, which has been referred to as phygital mode (George, 2020) of education. However, it is challenging for organizations to implement the phygital model most effectively. The burning question here is what can be the effective teaching practices from a phygital perspective? Concerning all these challenges, the authors in this paper throw light on some of the effective teaching practices that could be followed in higher education regarding business schools (B schools) in India to achieve success during these uncertain times of the COVID 19 pandemic. It would be interesting to see the novel teaching practices in the phygital mode. There has been much research on education and teaching in the COVID pandemic. However, none of those have focused on the practices that can increase teaching effectiveness in a phygital mode, specifically in a B school context. Moreover, the empirical or qualitative studies are restricted to the study contexts and fail to present more generalized information. Thus, we collected information from secondary sources to present information that the education institutes can practically use. We use Kolb's Learning Theory, John Dewey's theory, Jack Mezirow's transformative learning theory, and Jean Piaget's theory to present a viewpoint on some effective teaching practices that can improve teaching effectiveness in a phygital mode. Thus, we intend to contribute to the extant literature on education and teaching practices through this study. We also present a framework based on the research findings that the education institutes can use for designing effective teaching pedagogies.

HOW INDIAN BUSINESS SCHOOLS WOULD ADAPT TO THIS VIRTUAL TEACHING?

The authorities may envision a bright future. The management may take this vision to the next level by putting it into practice. However, ultimately it is the teaching fraternity (Faculty members) who would have to work at the ground level to change (Bates, 2000). When it comes to distance learning courses, the primary concern is regarding the infrastructure and internet support from the Institution, quality of lectures as they will be delivered online (Bao, 2020). The research of the adoption of a complete online teaching mode is yet in its nascent stage to recommend anything. Hence institutions have a significant role in lending proper and timely support to adopt a complete online teaching mode. For instance, the exciting research in Computer Vision focuses on predicting the pose of the human head in an image. This describes the object's rotation in 3D space. By predicting this, we can determine the direction a human head face. Having a computer able to figure out which direction a human head is facing provides many practical applications. For instance, it can be used to map a 3D object to match the direction of the students in the classroom to have the best visual effect on their minds for learning purposes (Liu et al., 2021). Also, in a case study experimentation of Peking University's online education during COVID 19, few specific instructional strategies were presented to summarize current online teaching experiences for university instructors who might conduct online education in similar circumstances. For instance, online effective delivery mechanism, adequate support provided by faculty and teaching assistants to students, and high-quality participation for better student learning can be followed for better learning experiences (Bao, 2020). The authors have

highlighted some benchmarking teaching methods in the following sections of the paper to extract some learnings imparted in Indian business schools in India for the effective pedagogical methods amidst COVID 19. The research objectives of the paper are mentioned in the following section.

RESEARCH OBJECTIVES

The main objectives of the paper are as follows

1. To present some successful teaching practices that can be/ are followed in Indian Business schools amidst COVID 19.
2. To understand the challenges that came with adopting technology by both students and faculties amidst COVID 19.
3. To conclude, some principal teaching methods based on existing theories of learning from literature to create an effective blended environment for students and faculties in Indian business schools amidst COVID 19.

RESEARCH METHODOLOGY

This study had reviewed several online research articles published, newspaper stories, conference papers, working papers, and books using manual content analysis. It was a cross-sectional analysis where the authors searched various electronic databases in March and then again in June 2020 with no language restrictions. The authors also searched the WHO research database on COVID-19 with the term "school," which only resulted in one article that was not considered more general than specific to our topic. Therefore, the authors searched again using the keywords such as "teaching practices during COVID 19," "adoption of technology in higher education during COVID 19," "learning AND teaching pedagogy during COVID 19," "Indian business schools AND COVID 19," "digital learning during the lockdown," "online teaching during a pandemic," "education policy during COVID 19" and "phygital learning during the shutdown" and the combinations of these words. All authors performed data management and cleaning. All three authors triple screened (by S.C., S.P., and MV) the articles on title and abstract. The authors excluded viewpoint papers, systematic literature reviews, and studies on other viruses and other languages. The selected research papers were not limited only to India but also from the United States, United Kingdom, and Europe to gain an international view of the topic. As the authors analyzed the papers already written, there was no need to get the formal ethical clearance for citing them. The key themes identified and discussed included "online teaching practices during COVID-19," "blended mode of teaching in higher education," and the "shift towards online teaching during COVID 19."

All full-text downloaded articles identified were reviewed by S.C. The authors maintained to keep highly cited articles out of all downloaded articles for the present study. The authors did not try

to rate the quality of studies included in this paper. The authors also included findings of some preprint articles and peer-reviewed articles. Most of the articles cited are from renowned publishers like Elsevier, Emerald, Sage, Springer, Taylor and Francis, and Wiley. The different database searches identified 100 articles, of which 30 full-text articles were assessed, and eighteen were included in this paper. No relevant articles were returned searching the WHO Global Research Database on COVID-19. The search on medRxiv resulted in 20 preprint articles, out of which one was included in the review. In total, 30 journal articles, ten books, eight conference papers, and one working paper were included in this review (see the flowchart **Figure 1** below).

Emerging Teaching Practices Discussed

The word technology connotes different meanings to faculty members engaging in different subjects. For example, a teacher of mathematics and a philosophy teacher will have their ways to use technology for teaching their subjects. The word technology is often used in common parlance to digital devices, online and blended systems, scientific artifacts, tools, and other facilitating objects (Brown and Sammut, 2012). At times, technology also refers to engineering procedures that assist in the creation of new gadgets. It is now commonly used even in the arena of teaching (Elen and Clarebout, 2006). Few members of the teaching fraternity who are comfortable using the latest technology for teaching can be termed as those set of individuals who are welcoming the change in the gamut of teaching (Gershon, 2017).

Moreover, such individuals are the ones who are the pioneers in adopting this new digital teaching pedagogy across the globe. The theoretical framework which can be used to understand the online teaching and learning process is the Community of Inquiry (CoI) model (Refer to **Figure 2**), which consists of three critical factors: Social element, Cognitive element, and Teaching element (Garrison et al., 2000). It is the interactions of all three elements of the model that facilitates the educational experience for participants, as illustrated in **Figure 2**. Based on this model, Social Presence is understood as the ability of participants to project their characteristics and therefore presenting themselves as real people. Cognitive Presence is defined as the "extent to which the participants in any particular setting can make meaning through sustained communication" (Garrison et al., 2000). Teaching Presence is composed of the design of the educational experience and the creation of sound knowledge to better society (Garrison et al., 2000).

Reframing Brick and Mortar Practices in Virtual Spaces: Reflections From India

In 2006, Chau and Lam talked about unique teaching ideas to suit the age-old "brick and mortar" universities shifting to the online mode of teaching. Currently, India is in the initial stage of adopting an online teaching mode, and we are marching ahead with small but firm footsteps. One such breakthrough in online teaching was achieved through MOOCs (Massive Open Online Courseware) in India. Because of its immense benefits, MOOC is now acknowledged across the globe. It can successfully substitute the face-to-face teaching mode with online teaching by
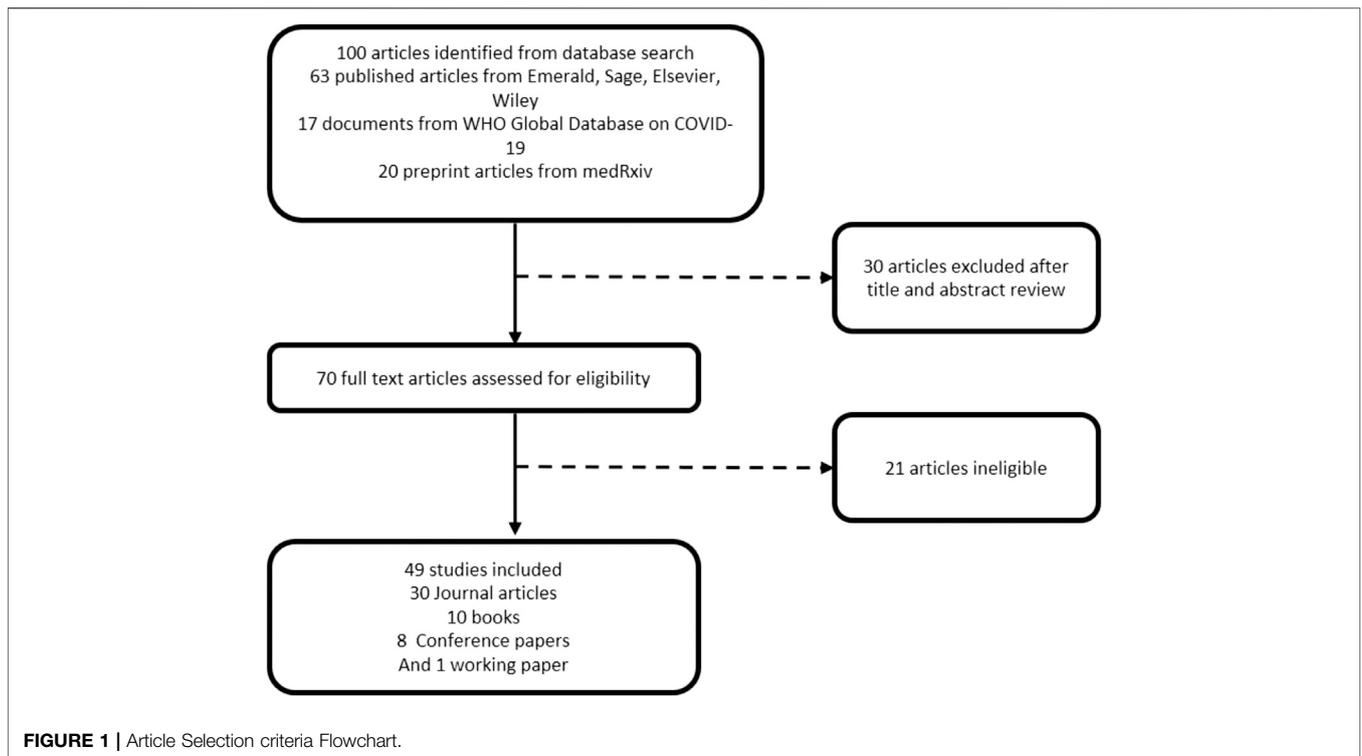
FIGURE 1 | Article Selection criteria Flowchart.
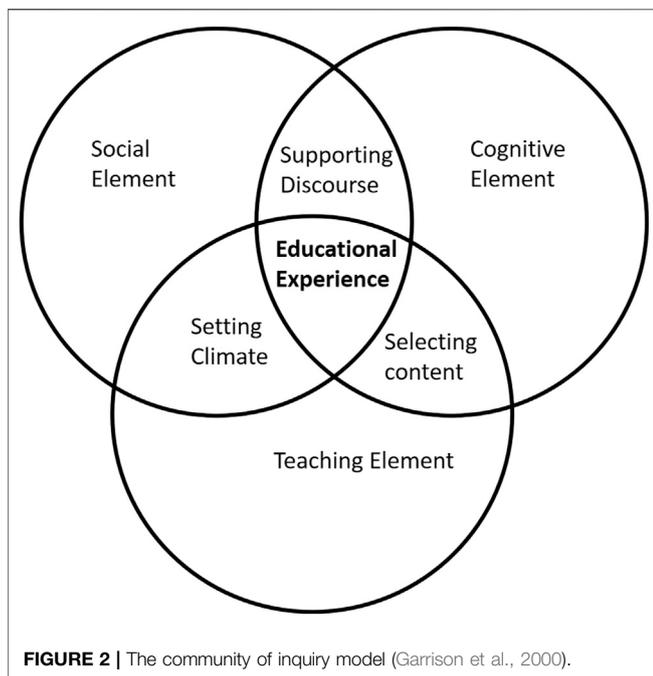
FIGURE 2 | The community of inquiry model (Garrison et al., 2000).

enhancing the pool of wisdom and facilitating blended teaching and learning environment. These online classes can be categorically classified under two heads, synchronous and asynchronous, based on the conduction of the classes. Synchronous mode refers to the type of learning where students and teachers are present at the exact location and at the same time for teaching and learning. This comprises in-person classes (where teachers and students are present in the same classroom), online meetings and live streaming of classes or demonstrations on Zoom, MS Teams, Google meet, and other platforms (Calongne, 2008). Precisely it is a "real-time" type of learning where a group of learners is engaged simultaneously. Hence, it enables collaborations amongst the students and teachers to ask doubts and get them resolved on the spot. For example, webinars, online classrooms, and video conferences are examples of synchronous classes. Asynchronous mode refers to the universal form of teaching and learning that does not happen simultaneously or in the same classroom. The students are not present in the class at a prescribed time. However, they have access to the previously recorded lecture videos of their teachers in addition to online study materials (Hsiao, 2012). Students can respond through emails and any social media network. The teachers generally record their classes. This recording is made available to the students; it is a learner-centered approach, where the students can undertake any course without fulfilling the criteria of being present at the same time and exact location as the tutor. For instance, blogs, youtube videos, and online lectures are examples of synchronous classes. In line with this, the Indian institutes have also experimented with several experiential learning tools, e.g., uploading recorded videos of faculties, creating online discussion forums for students, asking students to upload their self-made videos, and embedding the research into the course curriculum (Mishra et al., 2020). Kolb's Learning Theory from the literature also emphasizes the "conversational learning" approach, which enabled learners to make meaning and convert experiences into knowledge through the exchange of

conversations (Kolb et al., 2002). The major challenge lies with the practical courses that are difficult to deliver online. One of the institutes in India created virtual labs where experiments were demonstrated through video conferencing (FutureLearn, 2020). Another issue was the support for students in remote areas with limited access to high-quality teaching and less knowledge of the English language (Flack et al., 2020). Several tech companies such as BYJU's worked towards this digital divide and create apps that support live classes and localized language for such communities. However, more needs to be done to cover the digital divide for these communities (Brundha and Chaturvedi, 2021).

Experiential Learning *Approach in Creating Virtual Management "Sandbox" in India*

The concept of sandbox technology in our paper denotes a cloud or a computer-generated space for teaching. However, the different methodology needs to be adopted for students' different age groups (adults, middle school students, and kids). This implies the policies and procedures adopted for higher education must necessarily be different for school-level education (Halupa, 2015). Thus, satisfying the needs and requirements of both sets of the audience. The teachers must adhere to an altogether new focus and degree of teaching in the classrooms. The tutor must curb all the obstacles that come his/her way during a teaching in an online platform. For this, the **practices** of "Experiential Learning" need to be embraced to gauge and then accentuate, strengthen, and communicate the experiences in activities. Experiential learning (E.L.) refers to the procedure that involves "learning by doing," resulting in gaining specific experience. For instance, a student learns by working in a company during the internship or learning to ride a bike. In this learning, the outcome is based on the involvement in the experience. Prior researchers have contributed several definitions for the E.L., the scope of which is extended to the pedagogies, learning domains, and undertakings (Eyler, 2009; McClellan and Hyle, 2012; Morris, 2016; Beard and Wilson, 2018). The philosophy mentioned above of experiential learning has its roots in John Dewey's theory. Dewey (1938) emphasized that experience is continuous, and the experiential learning process is of vital importance to adult education. Therefore, E.L. is a procedure that involves immersion and self-direction, resulting in a meaningful experience that helps gain knowledge that can be applied in future contexts. Given the issues of student engagement and impactful learning for the students at the online platform, the faculties have identified ways to implement the experiential learning model (ELM) effectively.

For example, at some universities, the courses were redesigned utilizing the experiential learning module to enable the MBA students to develop presentation skills to enhance their employability. One of the universities used iPads equipped with Panopto's mobile app, creating an experiential learning opportunity for the physician students. Students made videos of their role-play interacting with patients uploaded on the video content management system of the university from where they were available to the professors who left feedback for the students. On the other hand, some universities are including Industrial Informatics into their master's degree curriculum to address

Industry 4.0. The pandemic has resulted in the growing importance of Cyber-Physical Systems (CPS) in the industry, resulting in great demand for CPS talent and know-how. The mission of academia is to address the needs of the industry for CPS engineers and develop a curriculum to fill the existing gaps in the qualification of the CPS workforce (Colombo et al., 2020).

Offering À La Carte and On-Demand Online Courses in Indian Business Schools

The pandemic has compelled the education institutes to embrace virtual teaching and learning methodology. This has further pressed the institutes to offer an extensive menu of courses and those in great demand. For instance, mechatronic education and experimental systems have, for example, been developed to facilitate experiential education and enhance the learning process in order to encourage students to think. The Mechatronics systems are designed, implemented, programmed, tested, and used by the students successfully within designed Lab sessions. The developed systems have their learning indicators where students acquire knowledge and learn the target skills through engagement, hands-on experience, brainstorming, and interactive discussions (Habib and Nagata, 2020). To provide such courses to the students, first teachers will have to learn these courses to further enhance their knowledge in the respective subject. This is in synchronization to Jean Piaget's cognitive development of experiential learning. Piaget (2008) asserted that learning is a lifelong process of finding knowledge from experience. Some countries like Germany are surveying the teaching fraternity to understand their requirements, abilities, and career enhancement objectives. Subsequently, when the colleges reopened, they were given free tutoring on the curriculums they were keen on. This exercise is intended to meet the distinctive requirements of teachers. However, the primary motive was to provide skill-based courses to all teachers. Later, these teachers were summoned to teach the same skill-based course to the students. This was the practice followed by some countries like Germany. Taking cues from there, India can follow on these lines and offer professionally motivated courses in Indian B schools.

Strengthening Resilience in Indian Schools in Challenging Times

The word resilience means having the ability to have a successful outcome despite being in a challenging situation (Masten et al., 1990). The school authorities and teachers are solely responsible for promoting resilience amongst the student community in these challenging situations. The authors in the present paper have arrived at specific recommendations to foster resilience amongst the student community towards online teaching with the help of studies conducted by Benard (2004) and Henderson and Milstein (1996):

1. It is improving social skills by showing affection and concern towards adults (e.g., instituting absolute optimistic regard, establishing a philosophy of care and mutual admiration, constantly appreciating each-others work).
2. Establishing elevated and clear expectations for educational accomplishment and school room conduct

(e.g., cooperation and dispute solution, constant enactment of policies and directions, conveying a belief that students are adept at increased academic performance).

3. Offering prospects for significant involvement in learning (e.g., forming the curriculum so that every child benefits, linking the syllabus to learners, supporting home dialect, offering practical learning, encouraging the use of group activities while teaching the course).

Improving Digital Pedagogical Methodology in India

The teaching pedagogies have been transformed with the information and communication technology (ICT) innovations (Konig et al., 2020). For instance, ICT has facilitated the faculties adoption of student-centric practices such as learning through projects (Law, Pelgrum, and Plomp, 2009) that helped the promotion of purposeful learning (Koh and Chai, 2014), inquiry-based learning (Bell et al., 2013) and learning through problem-solution (Walker et al., 2012). Prior researchers have presented strong arguments in favor of ICT as a catalyst for a metamorphosis of the teaching pedagogies (Beauchamp and Kennewell, 2010). The model identifies the interaction between the knowledge of a faculty about the technology, pedagogy, and content for an efficacious utilization of ICT for delivery in a classroom (Herring et al., 2016). There has been much research on the factors that affect the acceptance of technology in education. This includes the adoption of e-learning among the students, e.g., Boateng et al. (2016), Sanchez et al. (2013), Zhou and Xu (2007) and teachers, e.g., Holzmann et al. (2020), Salinaz et al. (2017), Buckenmeyer (2010), Nicolle and Lou (2008), Kotrlik and Redmann (2009). However, the COVID 19 pandemic created a situation wherein both the teachers and students had to adopt the technology not by choice but as an essential requirement for the education system's smooth functioning. The adoption came with many challenges related to the lack of knowledge about the use of technology by both students and faculties, difficulty finding and selecting a suitable platform for online class delivery, cost of the license, and issues related to the infrastructure unavailability of the Internet in remote areas. This pivots the need for research from factors that affect the technology adoption to the factors that would affect the continued use of technology for blended learning and student benefit. Instead, research that can guide the behavioral change strategy for both students and faculties would be needed.

Moreover, the content delivery and examination pattern required a significant overhaul. The uncertainty of events posited a dilemma for the education institutes and policymakers about the pattern of examination. A need-based approach was followed at the school level. Some primary class students were promoted directly to the next class; an online examination was conducted for several higher semester classes and offline exams for those who appeared for the board (secondary and senior secondary) exams. The universities and Business schools majorly adopted online mode for conducting the examinations as the direct promotion could affect the career and placement. As far as higher education is concerned, it seems that the teaching pedagogies would adopt the blended learning and teaching mode for higher effectiveness.

Transformative *Learning for Inclusive Online Pivot in India*

The introduction of digital tools has enabled educators towards a blended approach for learning; for instance, flipped classrooms providing room for the enhanced classroom experience. Educators are using the technology to develop videos that enrich the digital content, thus enabling them to utilize the free time for other innovations. According to Jack Mezirows (2003), in transformative learning theory, learning begins with an experience called a disorienting dilemma (cognitive dissonance, which happens on realizing that your current understanding of the world does not fit with the current evidence). The abrupt, unplanned, and rapid transition into online learning triggered by COVID 19 has contributed to cognitive dissonance because our educational expectations are called into question. If we talk about India, the central issue was faced by the students who are supposed to undertake practical field training called summer internships, where they are supposed to be trained on the job while working with the corporation. The lockdown and closure of most offices resulted in a lack of opportunity for the student to go through this practical training. Several students got the work from a home internship, but they could not learn or get accustomed to the environment and system in which work is done in a corporate (Srivastava and Chaturvedi, 2014). Some institutes facilitated the students by providing them projects that required in-depth study of the field or industry they wanted to cope with. This helped the students to get prepared for the jobs. However, the kind of "mindset change" a student goes through after and on-the-job training was absent. This posits the need to develop an education system of blended learning with an industry interface embedded within the course for a better experience. Here comes the role of a mentor who accelerates preliminary activities that enhance introspection, face challenges, and includes probes and mutual understandings (Chaturvedi et al., 2019). However, it is ideal to understand the requirements of the students and the demands of the course curriculum and then adopt a suitable teaching methodology that is acceptable and understandable by the majority of the audience at large. In the end, the authors support the notion of Sharp and Marchetti (2020), who said that the natural way should be to choose the correct teaching practice in the present phygital scenario of COVID 19.

The authors point out these examples to take lessons for Indian management schools (Chaturvedi, 2020) where the whole idea of experiential learning through video observation is picking up fast. Moreover, given the difficulties with effective experiential learning with the existing platforms raises a need for the development of e-learning facilities that can be compatible with the extant infrastructure, thus pivoting towards blended learning/phygital learning.

Collaborating With Parents Through School-Wide Online Strategies in India: Apps discussed

As per recent research findings, there has been a substantial drop in the number of parents who believe in the effectiveness of the personalized methods of communication to get informed about student performance, e.g., face-to-face meetings. In India, parents

take an interest in the education of students at the university level, and several universities communicate the performance to the parents through various modes such as phone calls. The findings indicate the increasing adoption of digital methods of communication for getting informed about student performance. This opened a door for a new opportunity and apps such as ClassDojo, Spotlight, Remind. Seesaw developed an interface that allows mobile messages, videos, and other alerts about its activities and student performance. For instance, a university used technology to send texts about grades, attendance, and assignment submission to the parents, resulting in an increase in student attendance by 18% and a decline in the course failures by 39% (Bergman and Chan, 2017).

Another example is about a university that sent literacy tips along with text messages to the parents. The outcome was an increased parent-teacher interaction that increased the literacy scores for students. There is an increase in such apps that are parent engaging; a selected few are presented here with their success stories for learning purposes. B schools can adopt the same to enhance the learning experience for students.

Class Dojo
ClassDojo is a popular tool that allows the instructors to provide feedback to the parents on students' behavior. It allows communication in 35 languages. The parents can also obtain information about their child's school experience and class

through pictures and videos. The app is substantially popular among the K-8 schools and has successfully connected with 15 k new schools since 2019. This app can be helpful if implemented in Indian B schools to give parents community feedback about their children.

Spotlight
The Spotlight was developed by Oakland Unified School District (OUSD) in California while looking for means to reach the diverse families in a high-poverty urban district with just 28% of English speakers and above 50 languages spoken over. The video report card application of Spotlight was piloted in three schools in 2015 that 16 schools adopted till the year-end. Spotlight allows the texting of a link to the parents that land them to a personalized video that provides a detailed report on the student performance, including the performance summary in core subjects, areas of improvement, and guidance towards improved learning such as reference of library groups or open-source learning platforms.

Remind
Remind is used by Groton elementary school in rural New York to connect with the parents. The instructs can use the app to send personalized and class-wide and school-wide texts to the parents. The instructors send weekly texts about the learning and development of the students that can be translated into above
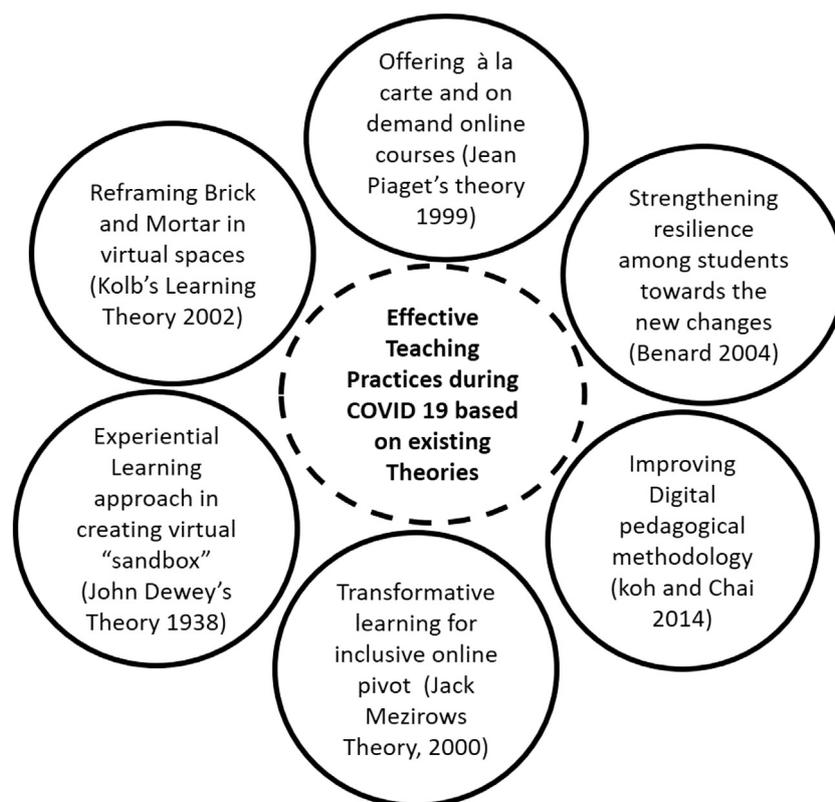
FIGURE 3 | A pictorial representation of the main findings of the paper.

70 languages. The application also facilitates the sending of pictures of students in class and methods that parents can use to help the students with the homework. The instructors can identify the messages that are read and make decisions about follow-up through other means.

Seesaw

Seesaw was adopted by over 25,000 schools in the United States across 200,000 classrooms and in more than 150 countries for effective learning in the schools. Through this app, the students can describe their learning to the parents in live classroom settings. The student can document their project by video recording, pictures, and audio and show to parents. The text can be sent only after the approval of the instructor, and the parents can respond with questions. Several instructors use the app to communicate the student learning is to the parents. The authors share that these apps can be successfully launched in Indian Business schools to help the school make an inclusive and effective "online pivot" during COVID 19.

CONCLUSION

Taking cues from some established theories of learning, the authors furnish unique teaching initiatives in this paper to combat the challenges of online teaching put forth because of the novel COVID-19 pandemic (Refer to **Figure 3**). Covid-19 exerted several changes in the education system at a broad scale. The pandemic concurs with the increased potential of information technology. The outcome is likely to reconfigure the teaching pedagogies making use of the information technology. While one cannot deny the importance of the offline education system, the future would be directed towards blended learning guided towards online pivots and a digital mindset. When we move towards digital technology adoption for teaching, several issues need attention. First, the development of an appropriate interface for learning and engagement compatible with the extant infrastructure is required, given the financial concerns of institutes discussed in the opening sections. Second, the efforts must be guided towards the continued adoption of technology for education. Third, due to the limitations about the internships that enabled the B school students to learn in a natural working environment, the pathways for effective experiential learning that can also enhance the skillset and employability of students need to be determined. Lastly, techniques to fill the digital divide for all-inclusive learning need immediate attention. The COVID 19 pandemic has guided the education system towards a new paradigm that needs to be explored for effective blended learning. The authors firmly believe that B schools will rise to the occasion and adopt benchmarking teaching practices,

leading to effective student-teacher virtual communication in India.

Future Directions

The study provides valuable insights on effective teaching practices in the online mode in the COVID situation. However, there are several limitations of the study that can be covered in future research. The study is limited to higher education in the context of B Schools in India. Future research can be extended to the other courses in various regions to understand the online teaching practices. Moreover, qualitative data collected through interviews with the beneficiaries and participants can provide a comprehensive understanding of the various online teaching pedagogies (Adedoyin and Soykan, 2020). The shift to online teaching is still in the nascent phase, and the long-term implications and effects are still unknown. Future studies can conduct cross-sectional surveys to analyze the potency of the various teaching practices in online mode. It would be interesting to understand what factors would govern the continued use of the blended learning approach even when the pandemic is over.

Limitations of the Study

The study cannot be generalized in the absence of empirical analysis. Hence there exists a scope for further research by including data collection. The inferences drawn from the study can vary depending upon the size and availability of resources with various universities. The study talks about the extended infrastructure required to adopt online teaching methodology but did not throw much light on the methods in which this infrastructure can be developed. The study focuses on the continued adoption of technology for education. However, given that India is a developing nation and not all institutes and Universities have access to the high technology required for the said purpose, it might take some time for the universities to absorb online learning and teaching.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

SC and SP contributed to the conception, structure of the paper, and interpretation of available literature. SC contributed to the development of the initial draft. MV reviewed and critiqued the output for important intellectual content. All authors contributed to the article and approved the submitted version.

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The Impact of Demographics, Life and Work Circumstances on College and University Instructors' Well-Being During Quaranteaching

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In response to the outbreak of the COVID-19 pandemic, educational institutions around the world were forced into lockdown in order to contain the spread of the virus. To ensure continuous provision of education, most transitioned to emergency remote instruction. This has been particularly the case in higher education (HE) institutions. The circumstances of the pandemic have brought unprecedented psychological pressure on the population, in the case of educators and students exacerbated by the transition to a mode of instruction that was completely novel to the majority. The present study examines how college and university instructors dealt with teaching online in these unparalleled circumstances, with a focus on how factors connected with their daily lives and livelihoods influenced their well-being. Between April and September 2020, a comprehensive online survey was filled out by 804 HE instructors from 92 countries. We explore how sociodemographic variables such as gender, age, relationship status, living conditions, and length of professional experience non-trivially affect situational anxiety, work-life synergy, coping, and productivity. The results contribute to a better understanding of the impact of the pandemic and emergency remote instruction on college and university instructors' well-being by explaining the mechanisms mediating the relationship between individual, contextual, and affective variables. It may provide helpful guidelines for college and university administrators as well as teachers themselves as to how help alleviate the adverse effects of the continuing pandemic and possible similar disruptions leading to school closures on coping and well-being.

Keywords: teacher well-being, emergency remote instruction, COVID-19 pandemic, negative affect, situational anxiety, loneliness, higher education, work-life synergy

INTRODUCTION

The circumstances of the pandemic have brought unprecedented psychological pressure on the population. The adverse—sometimes long-lasting—psychological impact of the lockdown restrictions, stay-at-home orders, quarantine, and other repercussions span anxiety, post-traumatic stress symptoms, psychological distress, confusion, panic disorder, anger, depression, insomnia, and emotional exhaustion (Brooks et al., 2020; Qiu et al., 2020; Cénat et al., 2021a).

Teachers and students have been among the more impacted groups (International Labour Organization, 2020). As campuses almost all over the world successively shut down, in order to ensure the continuity of learning and of communication between teachers and students (Karalis, 2020), educators were thrust into the provision of alternative modes of delivery, or "emergency remote teaching" (Hodges et al., 2020; Reimers and Schleicher, 2020) that for most was an entirely novel form of work. Often, the anxieties were exacerbated by job uncertainty, especially for faculty on precarious contracts who—as happened for instance across the United Kingdom—were often dismissed by their institutions in an attempt to cut costs (World Bank, 2020:10).

The combined effect of lockdowns and the transition to online delivery have severely affected teacher and student coping and well-being. The strong possibility of deteriorating mental health because of the sense of uncertainty and anxiety among students and faculty members was understandably envisaged already in the initial stages of the pandemic (Sahu, 2020).

LITERATURE REVIEW

The impact of the COVID-19 pandemic on higher education has been a burgeoning topic of discussion (Fischer, 2020). However, the majority of the extant literature concerned with "pandemic pedagogy" tends to focus on the logistics and provision of training (Reimers and Schleicher, 2020), without taking into account the psychological impact of the situation on the teachers' functioning, let alone trying to tease apart the relative influence of the factors affecting instructors' well-being. For instance, the University of Houston (2020) published a report summarizing the faculty's perceptions regarding the transition to a remote teaching model, revealing significant variation in terms of the implementation of technology tools and of the mode of instruction. Watermeyer et al. (2021) carried out a survey of academic teachers' reaction to the move to online teaching, and found that the majority of the respondents felt confident or strongly confident in their ability to facilitate online teaching and assessment and considered their institutions to be supportive in facilitating the move to online delivery. Bensaid and Brahimi (2021) likewise attributed the successful maintenance of the learning cycle in higher education institutions in the Gulf to their already established distance education, swift administration and policy steps, and access to resources. Jelińska and Paradowski (2021b) in turn revealed how teachers' perception of how their students were coping with the novel situation was influenced by their own demographics and professional adaptation to emergency remote teaching.

Where the psychological impact of the pandemic in education was a concern, the existing literature has tended to focus on the student population. A topical analysis of tweets (Duong et al., 2020) revealed that negative sentiments toward the central issues of COVID-19 were significantly higher among students than in the general population. Khodabakhshi-Koolaee (2020) in interviews with 15 postgrad students in Iran who had experienced living in quarantine, as three of the four main emerging themes identified (i) developing negative emotions,

confusion and pessimism, (ii) concerns about family health, as well as (iii) economic and social concerns and "fear of tomorrow." In a qualitative phenomenological study with five university students in the Philippines, Alvarez (2020) showed how learning engagement and isolation and the lack of affective and emotional support affected learning engagement. Another study (Yang et al., 2021) showed that students' self-efficacy and well-being were positively predicted by their perceived closeness with the teacher, peer influence, and perceived control over own learning. Students' perceived learning outcomes were also found to be positively influenced by instructional support and instructor innovation, and–interestingly–negatively by teacher performance (Wang et al., 2021). In a multi-national survey of undergraduate students, Nguyen et al. (2021) reported that the majority preferred synchronous classes, which mode–especially when it involved active-learning techniques–correlated with higher levels of engagement and motivation. Student engagement and adaptability were also found to significantly correlate with academic emotion (Zhang et al., 2021). An analysis carried out at a university in Russia (Dikaya et al., 2021) revealed an association between students' attitudes to forced remote learning and their interpersonal communicative skills and thinking and learning styles. A survey of students' emotions during and perceptions of the shift to online teaching at a Greek university (Karalis and Raikou, 2020) found that although the majority of the students were satisfied with the new way of attending classes, upon the closure of the university over three quarters had felt negative emotions such as stress and anxiety about how the studies would be completed, fear of the possibility of non-continuation of studies, and/or sadness about the interruption; after the online classes had started, some of the initial negative emotions gave way to an increase in relief that the semester would not be lost, and joy at the continuity of the classes. Across the Turkish border, students reported high perceived stress, mild generalized anxiety, and low satisfaction with life (Aslan et al., 2020). In a questionnaire probing the mental health of medical college students, Cao et al. (2020) found that risk factors increasing anxiety were economic consequences as well as having relatives or acquaintances infected with SARS-CoV-2, while social support, living with parents, and family income stability were protective factors. Similar results were obtained by Wilczewski et al. (2021), whose investigation of the psychological and academic effects of learning online among international students enrolled at the University of Warsaw revealed that those who had returned to their home countries (and therefore likely had familial support) exhibited higher academic adjustment, while quarantine and self-isolation increased the levels of loneliness – and acculturative stress when in the host country. Amendola et al. (2021) study carried out among students in Switzerland showed that anxiety symptoms decreased with time, and its levels were predicted by older age, female gender, out-of-country nationality, loneliness, concerns about own health (positively), and resilience and social support (negatively). Awoke et al. (2021) measured perceived stress among health science students in Ethiopia, with identified correlates of the construct including rare contacts with friends and a decreased household income. In a study employing interview surveys with 195 university

students in the United States, over seventy per cent of the participants indicated increased stress and anxiety due to the COVID-19 outbreak. The identified factors that contributed to the increased levels of stress, anxiety, and depressive thoughts among the students included among others fear and worry about their own health and the health of their loved ones, difficulty in concentrating, disruptions to sleeping patterns, decreased social interactions due to physical distancing, and increased concerns regarding academic performance. To cope with stress and anxiety, participants sought support from others and helped themselves by adopting either negative or positive coping mechanisms. Clabaugh et al. (2021) found that levels of stress and difficulty with coping with pandemic disruptions were related to neuroticism, an external locus of control, gender, and ethnicity, while a study from Mexico (Gaeta et al., 2021) discovered a relationship between university students' self-regulated learning and emotions such as tranquillity, hope, gratitude, joy, loneliness, and disinterest, mediated by coping strategies. A study by Alemany-Arrebola et al. (2020) showed that college students with a higher level of anxiety expressed more negative emotions and declared lower academic self-efficacy. A World Bank report on tertiary education during the pandemic recognized that "[l]ong periods of self-isolation can have an adverse impact on the psychological well-being of students and staff, especially for those who live alone, international students, and students/staff who are not in their place of origin" (2020:6).

On the teacher front, Jelińska and Paradowski (2021a) demonstrated how educators' engagement in and coping with remote instruction were moderated by gender, teaching level, mode of delivery (synchronous vs. asynchronous), and the economic status of the respective countries, while MacIntyre et al. (2020) investigated the correlates of approach and avoidant coping strategies among an international sample of language teachers during the conversion to online instruction. Our own analysis of responses from 1,149 language instructors revealed that on average, they found that the remote mode of delivery depressed students' language progress by around 64% (!), with concern about students' outcomes most prominent in beginner-level classes (Paradowski and Jelińska, under review a). Elsewhere (Paradowski and Jelińska, under review b) we analyzed how inequalities among educators related to demographics, family support, access to resources and infrastructure, and anxieties about the future influenced their psychological overload, and how this influence was mediated by their perception of student coping. We also identified predictors of stress among 435 linguistics instructors teaching online, revealing the influence of anxiety about the future, living conditions, self-acceptance, appraisal of the situational impact, course optionality, and perceived effectiveness of the virtual mode of delivery, with a mediating effect of acceptance of the virtual instructional mode (Paradowski and Jelińska, under review c). A study carried out after school reopening among teachers from the Basque Country (Ozamiz-Etxebarria et al., 2021) showed that levels of anxiety, depression and stress symptoms were influenced by gender, age, job stability, the level of education taught, and parental status. In the Philippines, Rabacal et al. (2020) revealed a moderate impact of COVID-19 on teachers' quality of life, while

Oducado et al. (2020) found that more than half of the teachers surveyed experienced moderate stress related to the epidemic, but these authors focused primarily on the health factor. Otherwise, however, studies examining the relationships between instructors' adaptation to and well-being during the crisis teaching period and background variables have been scarce. This contribution intends to help fill the lacuna by investigating how university instructors' sociodemographic characteristics as well as life and work circumstances affected their coping and wellness.

Wellbeing constitutes a complex and multi-dimensional construct related to life satisfaction, resilience, work outcomes, more adequate regulation strategies and better health (Keyes, 1998; Diener et al., 1999; Diener, 2009; Dodge et al., 2012; Fisher, 2014), and is defined in various ways generally within either a *hedonic* or a *eudaimonic* theoretical approach (Kesebir and Diener, 2008). According to the *hedonic* tradition, subjective wellbeing constitutes "a person's cognitive and affective evaluations of his or her life" (Diener et al., 2003:63). The cognitive component reflects a sense of satisfaction with life, whereas the emotional element is composed of high positive and low negative affect referring to moods and emotions (e.g., Bradburn, 1969; Diener, 1984, 2006; Diener and Suh, 1997:200; Diener et al., 1999; Kahneman et al., 1999; Lyubomirsky and Lepper, 1999; Arthaud-Day et al., 2005; Kim-Prieto et al., 2005; De Leersnyder et al., 2013). The *eudaimonic* tradition in turn relies on a notion of psychological wellbeing which refers to positive psychological functioning and development covering purpose in life, autonomy, personal growth, self-esteem, acceptance, mastery, control, and positive relations with others (e.g., Rogers, 1961; Ryff, 1989a,b; Waterman, 1993; Keyes, 1998; Ryan and Deci, 2001; Keyes et al., 2002; Ryff and Singer, 2008). This theoretical approach also includes emotional and affect regulation (Korpela et al., 2018; Puente-Martínez et al., 2018), which are linked to positive self-image (including enhanced self-esteem), situation management, and relatedness (Koole, 2009).

In most theories, a key indicator of wellbeing is *positive* affect (Lyubomirsky et al., 2005; Cohn and Fredrickson, 2009; Kong and Zhao, 2013; Coffey et al., 2014; Szczygieł and Mikolajczak, 2017). However, existing *negative* emotions and mood should not be ignored as emotional wellbeing has been defined as "the ratio of positive affect (PA) to negative affect (NA) in a person's life over a representative time period" (Larsen, 2009:249). Studies indicate that the amounts of positive and negative affect are uncorrelated (e.g., Diener and Emmons, 1985; Schmukle et al., 2002), and that their relative contribution to emotional wellbeing varies (e.g., Larsen et al., 1990).

Many researchers have indicated that the negative affect system is more reactive than the positive affect system (e.g., Ito et al., 1998; Cacioppo and Gardner, 1999; Ito and Cacioppo, 2005; Grinde, 2012). Moreover, Larsen (2002) indicated that the same levels of objectively bad and good events cause respectively higher levels of negative than positive affect. As observed by Musch and Klauer (2003), compared with positive ones, negative events engage more attentional resources and are stored more accessibly in memory. These findings lead to the conclusion that negative affect is stronger than positive affect with respect to its reactivity, duration, and cognitive processing

(Larsen, 2002, 2009; Larsen and Prizmic, 2008). Individuals tend to pay more attention to negative information compared to positive information, processing and recalling the former more thoroughly (Baumeister et al., 2001; Rozin and Royzman, 2001). As a result, negative emotions and mood influence overall emotional wellbeing to a greater extent than positive ones (Larsen, 2009). For this reason, Grinde (2016) suggested that negative feelings should be included in wellbeing measures. In this study, we focus on this aspect of emotional wellbeing.

In the ongoing discussion about the relevant definition of well-being, Dodge et al. (2012:230) took into account various existing conceptualizations and characterized wellbeing as the balance between individual psychological, social and/or physical resources and psychological, social and/or physical challenges encountered in everyday life. The challenges introduce an imbalance, which in turn reduces wellbeing. To restore the equilibrium and regain their wellbeing, an individual needs to use or adapt all their resources.

This approach seems to be particularly relevant in the context of the COVID-19 pandemic and crisis shifts in life such as the abrupt transition to remote teaching, which are potential challenges disturbing teachers' wellbeing. Studies on past infectious disease outbreaks have shown that such health emergencies impact survivors', their families', and affected communities' mental health and can lead to higher levels of anxiety, PTSD, insomnia, and depression (Mohammed et al., 2015; Keita et al., 2017). Confinement and social and physical distancing can additionally exacerbate the negative symptoms and require additional relevant individual resources in order to re-establish the balance and protect wellbeing. A body of research from the COVID-19 pandemic has accordingly identified numerous stressors and risk factors for mental health, spanning but not limited to fear of or actually getting infected (Bo et al., 2020; Nguyen et al., 2020; Rogers et al., 2020), inadequate information as well as excessive consumption of negative information from social media (Gao et al., 2020), the experience of quarantine (Lei et al., 2020), infection and/or death of loved ones, stigma, social isolation and loneliness, frustration, boredom, job/wage losses and associated financial insecurities (Brooks et al., 2020; Cénat et al., 2020, 2021b; Nicola et al., 2020), among others. Not surprisingly, studies have reported increased levels of anxiety (Lee et al., 2020; Lei et al., 2020; Moghanibashi-Mansourieh, 2020), distress (Hao et al., 2020; Mazza et al., 2020), post-traumatic stress (Bo et al., 2020; Liu et al., 2020), depression (Lei et al., 2020; Nguyen et al., 2020), insomnia (Li et al., 2020), and other dimensions of psychological impact (Ahmed et al., 2020; Cao et al., 2020; Moccia et al., 2020; Xiong et al., 2020; Cénat et al., 2021a,b; Huang and Zhao, 2021) in pandemic-affected populations.

Teachers' work is considered to be one of the most stressful professions (Frenzel et al., 2016; MacIntyre et al., 2019). Many researchers have observed that teaching is related to a lower-than-average level of mental health, poorer physical health, and lower job satisfaction, making teachers particularly vulnerable to burnout (Johnson et al., 2005; Chang, 2009; Brackett et al., 2010; Keller et al., 2014; MacIntyre et al., 2019). All these factors may significantly reduce teachers' subjective wellbeing (Kieschke

and Schaarschmidt, 2008; Woolfolk Hoy, 2008) and decrease their work effectiveness and learners' outcomes (Klusmann et al., 2008; Day and Gu, 2009; Frenzel et al., 2016; Lee et al., 2016). In addition, in the context of the COVID-19 pandemic the conditions of living and working under lockdown could induce negative feelings and increase teachers' negative affect. An online poll of 1,122 US faculty members conducted in October 2020 (Business Wire, 2021) revealed that more than twice as many respondents were feeling stressed, fatigued, and angry compared with the year before.

The COVID-19 pandemic enforced various challenges such as remote work, limited social interactions, and social isolation, provoking feelings of situational loneliness, which may negatively affect health and wellbeing (DiGiovanni et al., 2004; Cacioppo et al., 2010; Lin et al., 2010; Theeke, 2010; Beutel et al., 2017; Mullen et al., 2019; Son et al., 2020; Groarke et al., 2020; Nguyen et al., 2021). In the United Kingdom, 36% of adult respondents declared feeling lonely sometimes or often during the epidemic (Li and Wang, 2020). Higher loneliness was related to physical distancing and reduced social contact (Losada-Baltar et al., 2021). It was also associated with financial concerns and worries about the impact of prolonged quarantine as well as feelings of fear and uncertainty, increased depression, anxiety, stress, and an increased affective response to different aspect of the pandemic in Poland, the United Kingdom, and the United States (Brooks et al., 2020; Holmes et al., 2020; Jia et al., 2020; Kantor and Kantor, 2020; Killgore et al., 2020; Okruszek et al., 2020; Smith and Lim, 2020; Son et al., 2020; Cacioppo et al., 2021). Studies indicate that more frequent face-to-face contacts (unlike remote or virtual interactions), as well as closeness and quality of relationships moderate the negative loneliness-inducing influence of the COVID-19 pandemic and function as protective factors (Bu et al., 2020a,b; Groarke et al., 2020; Li and Wang, 2020; Tull et al., 2020; Rosenberg et al., 2021). Close, frequent and satisfying relationships constitute a basic human need and are core indicators of the social aspect of wellbeing (Baumeister and Leary, 1995; Ryan and Deci, 2000; Seligman, 2011).

The aforementioned results concern the general population. However, there is little evidence how situational anxiety and loneliness and anxiety as well as closeness of social relationships, which turned out to be significant determinants of functioning during the COVID-19 pandemic, influence the wellbeing of teachers, especially in the context of a challenge (Dodge et al., 2012) such as an emergency transition to distance instruction. In this study we examine the importance of these variables in the emotional aspect of wellbeing, alongside other factors such as perceived situational coping, work-life synergy (as an indicator of work/life satisfaction protecting against burnout) and self-perceived productivity (efficacy). We also take into account other individual factors and capital, such as teachers' age, gender, relationship status, and years of experience, which may play a particular role in protecting wellbeing (op. cit.).

The aim of this study is accordingly to investigate factors influencing higher education (HE) teachers' negative affect as a substantial component of emotional wellbeing (Larsen, 2002, 2009; also: Ito et al., 1998; Cacioppo and Gardner,

1999; Ito and Cacioppo, 2005; Larsen and Prizmic, 2008; Grinde, 2012) during the first few months of the COVID-19 pandemic in the context of adaptation to emergency remote teaching, thus potentially conditions more stressful than during "business as usual." Based on Dodge et al.'s (2012) resources–challenges balance approach to wellbeing and factoring in current research pointing to situational loneliness, anxiety and social relationships as among the most significant factors influencing mental health and wellbeing during the COVID-19 pandemic, we examine their role in the professional group of HE instructors during a time of heightened vulnerability to stress and its various consequences. In line with the recommendations by Bricheno et al. (2009), apart from subjective indicators we also include objective factors potentially determining wellbeing such as gender, age, relationship status, living conditions, and the number of years of teaching experience.

The study is guided by the following exploratory research questions:

RQ1: To what extent did HE teachers' negative affect vary depending on sociodemographic factors such as: (1a) gender, (1b) age, (1c) relationship status, (1d) living conditions, and (1e) length of experience in teaching?

RQ2: Which of the factors potentially affecting professional adaptation to emergency remote instruction in the COVID-19-related context, from among: (2a) situational loneliness, (2b) situational anxiety, (2c) family and social support, (2d) perceived self-productivity, (2e) situational coping, (2f) work-life synergy, and (2g) sociodemographic variables such as gender, age, relationship status, living conditions and length of experience in teaching, are associated with teachers' negative affect, and to what extent?

RQ3: What is the relative contribution of the respective predictors and to what extent does each of them determine teachers' negative affect and, consequently, emotional wellbeing?

MATERIALS AND METHODS

Participants

In this contribution, we focus on survey respondents from higher education institutions. From April through September 2020 a total of 804[1] HE instructors participated in the study. More than 80% were teaching at a university or graduate school. The instructors hailed from 6 continents and 92 countries and autonomous territories, half of them (52%) from Europe (**Table 1**). The mean reported age was 44.1 years (*SD* = 12.5), with over half the respondents aged between 36 and 55. Most did not report the length of their professional experience, 23% had been teaching for more than 5 years (*M* = 2.5, *SD* = 1.60), whereas 18.5% less than that. During the COVID-19 pandemic approximately three quarters were teaching synchronous classes

in real time, despite more than two thirds reporting no prior experience with remote instruction.

Almost 72% of the participants were female. A similar percent declared to live with their families or partners. Approximately 14% had a close other who had contracted COVID-19, and 3.5% experienced the death of a close person due to the virus.

Measures

To evaluate how the epidemic reality and remote teaching conditions affect instructors' wellbeing, we devised an online survey composed of 441 items (**Supplementary Material**). It included items concerning respondents' sociodemographics, the circumstances surrounding the participants' transition to emergency remote instruction, their personal experiences, behaviors, attitudes, feelings, physical and mental health, and personality traits. To measure psychological constructs, 23 short scales were developed from International Personality Item Pool [IPIP] (2018), International Personality Item Pool (n.d.) items. In order to glean more multidimensional information related to the specific circumstances of the situation that could not be properly measured with existing batteries, we complemented these with custom-made scales, single-item indicators, as well as open-ended questions.

In the following analysis we focus on the relative contribution of demographic variables as well as factors measured with four short scales (**Supplementary Appendix 2**) and three single-item indicators:

Negative affect was measured with 11 items assessing to what extent instructors felt negative emotional states such as sadness (e.g., "I have been sad"), irritation (e.g., "I have been feeling irritable"), strain (e.g., "I feel building up pressure"), and emotional instability (e.g., "I have been having bouts of anxiety/panic attacks") as well as symptoms of fatigue (e.g., "I feel tired during the day"). Items in this and the other scales were answered on a six-point Likert scale ranging from completely disagree to completely agree. The internal consistency of this scale was high (Cronbach's α and McDonald's ω_h = 0.92, Guttman's λ_6 = 0.90). Positive correlations (r = 0.75, $p < 0.05$) with perceived stress measured by the Perceived Stress Scale (PSS; Cohen et al., 1983) and negative (r = −0.45, $p < 0.05$) with self-compassion measured with the short form of the Self-Compassion Scale (Raes et al., 2011) corroborate good convergent validity of the scale developed for this study.

Situational loneliness was measured with a 3-item scale assessing the extent to which teachers felt lonely (e.g., "I feel lonely") and lacked contact with their colleagues (e.g., "I miss daily conversation with my colleagues") during the period of lockdown. In the current study its internal consistency reached Cronbach's α = 0.86, McDonald's ω_h = 0.85, and Guttman's λ_6 = 0.84; however, given its short length, further studies may be needed to verify its validity.

Situational anxiety caused by the COVID-19 pandemic was assessed with a 5-item scale measuring to what extent instructors felt worried about different aspects of their living conditions such as their future, job stability, housing conditions, economic situation, and concern about their family members (e.g., "I worry about my job stability"). The scale showed good internal

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[1]The data analysed in this paper form part of a much larger project https://schoolclosure.ils.uw.edu.pl that also included educators teaching in the K–12 track as well as student populations. These latter data are omitted from the analyses herein. For reasons of space and thematic coherence, we also exclude a presentation and discussion of other contextual findings as well as those from the battery of psychological tests that concluded the questionnaire.

TABLE 1 | Socio-demographic characteristics of the participants ($N = 804$).

	Frequency (n)	Percent (%)
School type		
community college/college/undergraduate school	109	13.5
university/graduate school	651	81.0
teacher training college	17	2.1
foreign language center affiliated with a university	27	3.4
Continent		
Europe	419	52.1
(Austria, Belgium, Belarus, Bulgaria, Czech Republic, Croatia, Cyprus, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Jersey, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, United Kingdom, Ukraine)		
Asia	122	15.2
(Bahrain, Bangladesh, Brunei, Cambodia, China, Hong Kong, Macao, India, Indonesia, Iraq, Israel, Japan, Jordan, Kuwait, Laos, Lebanon, Malaysia, Nepal, Oman, Pakistan, Palestine, Philippines, Qatar, Saudi Arabia, South Korea, Sri Lanka, Taiwan, Thailand, Turkey, United Arab Emirates, Vietnam)		
North America	210	26.1
(Bahamas, Canada, Costa Rica, Mexico, Puerto Rico, United States)		
Oceania	25	3.1
(Australia, Fiji, Kiribati, Aotearoa/New Zealand)		
Africa	17	2.1
(Algeria, Egypt, Kenya, Lesotho, Malawi, Mauritius, Morocco, Senegal, South Africa, Tunisia)		
South America	11	1.4
(Argentina, Brazil, Chile, Colombia, Peru, Trinidad and Tobago, Uruguay)		
Age group (years)		
<25	39	4.9
25 – 35	163	20.3
36 – 45	229	28.5
46 – 55	219	27.2
56 – 65	128	15.9
>65	25	3.1
not reported	1	0.1
Years of experience		
<5 years	149	18.5
6 –10 years	49	6.1
11 – 15 years	42	5.2
16 – 20 years	24	3.0
>20 years	70	8.7
not reported	470	58.5
Gender[2]		
female	578	71.89
male	215	26.74
non-binary/not listed	11	1.37
Relationship status		
in a relationship	579	72.01
single	207	25.75
not reported	18	2.24
Prior experience with remote teaching		
lack of experience	541	67.29
prior experience	265	32.71
COVID-19 cases among close others		
no	693	86.19
yes	111	13.81
COVID-19-related deaths among close others		
no	776	96.52
yes	28	3.48

[2]*Participants who selected the "Non-binary/Not listed" option as their gender constituted only 1.4% of the respondents and thus their gender was not included as a variable in the inferential analyses.*

TABLE 2 | Significant differences in teachers' negative affect (N = 804).

	M	SE	Negative affect				
			Effect size	95%CI		F or t	df
Gender			**$\eta_p^2 = 0.01$**	**0.002**	**0.03**	**4.67**	**2,801**
female	32.61*	0.53		31.56	33.66		
male	30.53*	0.83		28.89	32.17		
not listed/non-binary	40.73	0.68		32.53	48.92		
Relationship status			**d = 0.2**	**0.07**	**0.38**	**2.46***	**784**
single	34.02*	0.86		32.33	35.72		
in relationship	31.50*	0.53		30.47	32.55		
Living conditions			**$\eta_p^2 = 0.01$**	**0.001**	**0.02**	**4.52***	**2,801**
on my own	34.32*	0.98		32.37	36.26		
with partner	32.30	0.64		31.05	33.56		
with family	30.50*	0.81		28.91	32.09		
Age group			**$\eta_p^2 = 0.01$**	**0.001**	**0.02**	**5.96***	**2,801**
<25	35.33	2.25		30.78	39.89		
25–35	34.07	0.97		32.14	35.99		
36–45[a]	34.26	0.86		32.56	35.95		
46–55[b]	30.55*	0.85		28.87	32.23		
56–65[ab]	28.89*	1.02		26.87	30.92		
>65	26.68	1.84		22.87	30.49		
Professional experience in years			**$\eta_p^2 = 0.05$**	**0.01**	**0.09**	**3.95***	**4,329**
<5 years	33.41	1.11		33.72	38.96		
6 –10 years	34.61	1.49		28.77	33.53		
11 – 15 years	28.10	1.92		27.63	32.22		
16 – 20 years	28.79	2.30		23.17	30.93		
>20 years	28.37	1.23		31.31	33.65		

Superscripts indicate significant pairwise differences based on Tukey's post hoc test (p < 0.05) [for age groups: [a]25–35, [b]36–45; for professional experience: [c] <5 years].
*indicates statistical significance at p < 0.05; terms and values in bold refer to the influence on teachers' negative affect of each respective superordinate category.

consistency of Cronbach's α = 0.81, McDonald's ω_h = 0.82, and Guttman's λ_6 = 0.80. Positive correlation (r = 0.47, p < 0.05) with perceived stress measured with the Perceived Stress Scale (PSS; Cohen et al., 1983) indicates relatively good convergent validity of the developed situational anxiety scale.

Family and social support was assessed with 4 items measuring to what extent the teachers felt the support and closeness of their families and significant others (e.g., "I have good relations at home," "I feel comfortable having my family/partner/roommates/flatmates around during this time"). The scale reported good internal consistency of Cronbach's α and McDonald's ω_h = 0.80, and Guttman's λ_6 = 0.78.

The single-item indicators concerned situational coping, work-life synergy and self-productivity, complemented with sociodemographic information such as teachers' age, gender, relationship status, and years of professional experience. We applied the comprehensive single item approach (CSI) proposed by Konstabel et al. (2012, 2017), which assumes that the content validity of a one-item indicator is preserved when this item has a comprehensive content and is newly written instead of being selected from a longer scale. This approach is based on the assumption that every individual has self-knowledge and is able to characterize it if a given construct is sufficiently simple, unambiguous or circumscribed to be comprehensible to the respondent (Wanous and Reichers, 1996; Loo, 2002). This means that the CSI should not be applied to more complex traits or dispositions. Thus, in this research it was only used with generic and more homogenous variables.

Procedure

The custom-made online questionnaire was active from April until September 2020 on a commercial survey software platform (in order to reach respondents in countries where solutions such as Google Forms cannot be accessed without a VPN). Participant recruitment was carried out with a snowball sampling technique via several channels utilizing the researchers' direct personal contacts, mailing lists and websites of professional associations, and thematic groups and pages on social media. Participation was voluntary and the respondents were informed about the purpose of the survey. The protocol had received IRB approval.

Eligibility required having transitioned from regular face-to-face classes to online teaching as part of the response to the COVID-19 epidemic. The filter question excluded more than 13% of the initial survey takers – persons who either continued teaching face-to-face, or who had already been teaching online before the school closures happened.

Data Analysis

To observe the differences between the variables and to answer RQ1a-1e, we calculated a t-test for relationship status and one-way ANOVAs for all the remaining sociodemographic variables. To find the answer to RQ2 concerning the extent of the association between such potential factors affecting HE teachers' professional adaptation to emergency remote instruction in the COVID-19-related context as (2a) situational loneliness, (2b) situational anxiety, (2c) family and social support, (2d)

perceived self-productivity, (2e) situational coping, (2f) work-life synergy, and (2g) sociodemographic variables such as: gender, age, relationship status, living conditions, and length of experience in teaching on the one hand, and teachers' negative affect on the other, we calculated Pearson's correlation coefficient for continuous variables and Spearman's ρ for categorical variables. To study the impact of the predictive factors on negative affect as an indicator of teachers' wellbeing, we used STATISTICA's General Regression Models (GRM) module for building models containing categorical and continuous predictor variables (analysis of covariance design). As opposed to (multiple) regression models, applicable only to continuous variables, the general linear model permits analyses of any ANCOVA or MANCOVA design which includes both categorical (e.g., gender) and continuous predictor variables as well as a wide variety of different types of design. Analysis of covariance (ANCOVA), defined as a general linear model, combines at least one categorical predictor (i.e., one-way ANOVA) and continuous predictors (i.e., linear regression). The dependent variable(s) in such a general linear model is/are always continuous. Similarly as in the case of regression, using ANCOVA requires meeting five assumptions: normality of residuals, homogeneity of variance, homogeneity of regression slopes, linearity of regression, and independence of error terms (Garson, 2012; Philippas, 2014). In this study, a general linear model was the most suitable statistical tool as it allowed to take into account both categorical and continuous predictors. Applying forward selection, based on adding the most statistically significant variables to the model until there are no variables left meeting the entry criteria and a satisfactory regression equation has been found, underlies the answer to RQ3. This selection method allows building a purely exploratory model, which is not based on any theoretical assumptions, but on the statistically significant impact of the variables.

The linearity assumption was examined via a visual inspection of scatterplots, which indicated that the variables and the residuals of the regression (i.e., the errors between the observed and the predicted values) were normally distributed. The variance inflation factor (VIF) not exceeding 1.6 and tolerance values ranging from .64 to .94 indicated lack of multicollinearity. The lack of collinearity was also confirmed by a matrix of Pearson's bivariate correlations among all the predictors. A visual analysis of a scatterplot of residuals versus predicted values indicated that the assumption of homoscedasticity was satisfied as well.

The significance level was set at .001 for ANCOVAs and at .05 for the remaining analyses. Effect sizes are reported with Cohen's d for the t-test and η_p^2 for ANOVA, respectively.

RESULTS

To answer **RQ1** and find out whether and to what extent HE teachers' negative affect varied depending on sociodemographic factors such as: (1a) gender, (1b) age, (1c) relationship status, (1d) living conditions, and (1e) length of teaching experience,

we carried out Student's t-test and ANOVA. Descriptive statistics for teachers' negative affect with respect to the sociodemographic variables are displayed in **Table 2**. The results indicate that in the first few months of the COVID-19 pandemic, teachers differed in their wellbeing, which reflected their negative emotional states.

Significantly stronger negative moods were reported by female teachers ($M = 32.61$, $SE = 0.53$; possible value range: 11–66) compared with their male counterparts ($M = 30.53$, $SE = 0.83$). The intensity of negative affect significantly varied also between single individuals ($M = 34.02$, $SE = 0.86$) and teachers having partners or families ($M = 31.50$, $SE = 0.53$), with the former group feeling more negative emotions than the latter. The differences in negative affectivity were also age-specific; however, they were unrelated to teachers' professional experience.

The observed differences with respect to gender, relationship status, age and length of professional experience seem to suggest that teachers' negative affect during the COVID-19 pandemic may be related not only to psychological dispositions and states, but also to particular sociodemographic and situational variables.

To probe which of the factors affecting professional adaptation to emergency remote instruction are associated with teachers' negative affect and to answer **RQ2**, we conducted correlation analyses (**Table 3**). Negative affect was significantly and positively correlated with higher situational anxiety ($r = 0.47$) and situational loneliness ($r = 0.36$). Moreover, the stronger the negative emotional state, the less the teachers reported work-life synergy ($r = -0.43$) and the less productive they felt ($r = -0.33$) during the pandemic. Finally, those who felt more negative emotions were also coping worse than others ($r = -0.30$).

To reveal which of the factors affecting professional adaptation to emergency remote instruction predict teachers' negative affect, as well as provide an answer to RQ3 concerning the relative

TABLE 3 | Pearson's r[1] and Spearman's ρ[2] correlation coefficients between negative affect and factors influencing professional adaptation to emergency remote instruction in the COVID-19-related context.

	Correlation with negative affect	R^2	95%CI	
Situational anxiety[1]	0.47*	0.22	0.17	0.29
Work-life synergy[1]	−0.43*	0.19	0.14	0.24
Situational loneliness[1]	0.36*	0.13	0.09	0.17
Self-productivity[2]	−0.33*	0.11	0.07	0.15
Situational coping[2]	−0.30*	0.10	0.06	0.14
Age[1]	−0.27	0.07	0.04	0.10
Family and social support[1]	−0.18	0.03	0.01	0.05
Professional experience[1]	−0.17	0.03	0.01	0.05
Relationship status[2]	0.15	0.02	0.00	0.04
Gender[1]	0.05	0.003	−0.004	0.01
Living conditions[2]	−0.02	0	–	–

*significant at $p < 0.05$.

TABLE 4 | The regression results of the effects of variables predicting teachers' negative affect.

Dependent variable	R^2	Adj. R^2	F	df1	df2	95%CI	
Negative affect	0.49	0.47	37.40	8	317	0.41	0.53

TABLE 5 | General linear model with ANCOVA (forward selection stepwise regression) for variables predicting teachers' negative affect.

Step	Independent variables	b	SE	β	t	η_p^2	95%CI		F
1	Situational anxiety	0.64	0.09	0.30*	6.82	0.54	0.47	0.58	46.58
2	Work-life synergy	−2.24	0.38	−0.25*	−5.81	0.46	0.38	0.50	33.71
3	Productivity:					0.30	0.22	0.35	16.98
	reduced	4.31	0.77	0.26*	5.62				
	equal	−2.42	0.70	−0.15*	−3.50				
4	Coping: worse than others	5.75	1.82	0.26*	3.16	0.17	0.09	0.21	8.14
5	Age	−0.17	0.05	−0.16*	−3.77	0.26	0.18	0.31	14.21
6	Situational loneliness	0.33	0.16	0.09*	2.04	0.10	0.03	0.13	4.16
-	Family and social support								
-	Gender								
-	Relationship status								
-	Living conditions								
-	Professional experience								

b, unstandardized regression coefficient; SE, standard errors; β, standardized regression coefficient; * significant at p < 0.001.

contribution of the respective predictors and the extent to which each of them determines teachers' negative affect and, consequently, emotional wellbeing, we used ANCOVA to build a stepwise regression model with the forward selection procedure. It was preceded by a simple linear regression giving more general insight into the extent to which all the factors affecting professional adaptation to emergency remote instruction predict teachers' negative affect. The entire model, as shown in **Table 4**, is significant ($F_{8, 317} = 37.40$, $p < 0.001$) and predicts approximately 49% of variance in negative affect. The most influential predictor of teachers' negative emotional states was anxiety (β = 0.30, $t = 6.82$, $p < 0.001$), explaining approximately 22% of the variance in negative affect. The subsequent most consequential predictors turn out to be work-life synergy (β = 0.25. $t = −5.81$. $p < 0.001$) followed by teacher productivity (reduced: β = 0.26, $t = 5.62$, $p < 0.001$; unchanged: β = −0.15, $t = −3.50$, $p < 0.001$). The next important predictor is situational coping (β = 0.26, $t = 3.16$, $p < 0.001$). The last two moderator variables are teachers' age (β = −0.16, $t = −3.77$, $p < 0.001$) and situational loneliness (β = 0.09, $t = 2.04$, $p < 0.001$). It should be noted that all the influences of these predictors have medium to large effects (Cohen, 1988). Interestingly, family and social support as well as variables such as gender, relationship status, and length of professional experience no longer contribute to the regression model. The results are presented in **Table 5**.

DISCUSSION AND CONCLUSION

The current COVID-19 pandemic is unprecedented in scale, as are the nearly global school closures that have gone along with it. The well-being of students and instructors has been upended, to the extent that many instructors started contemplating quitting the profession (Business Wire, 2021; Gewin, 2021). The current study has attempted to reveal some of the mechanisms responsible for college and university instructors' differential coping with the transition and wellness, with the resultant model predicting approximately 49% of variance in negative affect.

The impact of anxiety was prominent not only in the statistics, but was also a recurrent theme in the open-ended questions, where the respondents repeatedly mentioned "anxiety and fear about the pandemic," "general anxiety about the world right now," "anxiety, workload, uncertainty," "my own personal struggle with anxiety increasing due to covid," and "the uncertainty and anxiety surrounding the state of the world in general."

The impact of gender on anxiety (albeit with only a very small effect size) mirrors the findings by Alemany-Arrebola et al. (2020) among college students, where women had higher scores in trait and state anxiety; the latter accentuated in cases where a relative had died – thus showing that the stressful situation of the pandemic and remote learning together with a critical event such as the illness and death of a relative or friend due to COVID-19 increases anxiety levels (and—in the case of the original study—influences the perception of academic self-efficacy). A similar conclusion was reported in Turkey by Aslan et al. (2020), where female (as well as less physically active) students displayed higher levels of perceived stress and by Karaman et al. (2021), in Switzerland by Amendola et al. (2021), and in the US (Business Wire, 2021; Clabaugh et al., 2021), while among teachers a similar trend was observed in the Basque Country (Ozamiz-Etxebarria et al., 2021). In the general population, three studies carried out in Italy (Mazza et al., 2020; Moccia et al., 2020) and Iran (Moghanibashi-Mansourieh, 2020) showed women's mental health to be more impacted than men's; on the other hand, research in China (Cao et al., 2020; Chen et al., 2020; Huang and Zhao, 2021) and a meta-analysis by Cénat et al. (2021a) of papers again mainly hailing from this country found no gender differences in females' and males' experience of pandemic-related stressors. A comparison of the results implies a possible role of context (teaching/studying vs others) influencing the potential role of gender in perceived situational anxiety.

Apprehension about job stability could be alleviated by institutions making furlough arrangements for all faculty and suspensions of staff dismissals at least during the period of the crisis, in line with recommendations by the World Bank, since "faculty dismissed at this time will find it almost impossible to secure alternative employment amid the crisis" (2020:10).

The adverse impact of loneliness is fairly straightforward and, as with anxiety, was a recurrent theme in the answers to the open-ended questions, which frequently mentioned "isolation, not being able to interact with my students, not being able to teach them;" "I feel isolated. The teaching is fine, but I have had very little interaction with colleagues, which makes me feel irrelevant;" "lack of contact with the students. I felt very isolated and like I was talking into the void;" "the isolation and feeling that I am not connecting with students and fellow teachers in my school;" or "disconnection from students." Loneliness constitutes an emotional experience provoked by unfulfilled needs for social contact (Margalit, 2010). Cacioppo and Hawkley (2009) point out that the experience of loneliness impairs individual ability to self-regulate affecting physiological, cognitive and emotional functioning. It may constitute an important risk factor for depressive symptoms even for healthy people (Cacioppo et al., 2006; Grov et al., 2010). Neto and Barros (1992) in their study examining loneliness among teachers found that educators whose professional experience was longer than 20 years were significantly lonelier than those with a shorter professional experience; the former group also experienced lowered self-efficacy, which constitutes one of the predictors of job satisfaction (Lent and Brown, 2006; Duffy and Lent, 2009). While loneliness is usually a temporary state, COVID-19-induced lockdown and social distancing may have extended it. Lack of personal contact with teachers and longing for live communication during the lesson were downsides of remote instruction indicated by around 80% of the students in a study by Karalis and Raikou (2020).

The significance of the right work-life synergy and maintaining the right priorities is especially important in view of the reality that ensuring of teacher and student well-being may sometimes be at odds with pressures to "cover the syllabus": "[t]here is a potential tradeoff between ensuring well-being and significantly increased screen time derived from a transition to distance learning" (Reimers and Schleicher, 2020:8). Our findings from a sample of nearly 1,500 educators (Jelińska and Paradowski, 2021a) showed that the most engaged and best-coping teachers were characterized by having modified their lesson plans and eased the grading scheme during this period.

Teacher well-being should never be forgotten, neither by administrators nor teachers themselves. Already in the spring of 2020, a guide published by the OECD recommended that:

Second only to supporting learning, a key priority of education institutions should be the well-being of students and staff… A protracted pandemic, and its multiple effects in the health, income and well-being of individuals and communities, is likely to strain the psychological reserves of all, including students and teachers. Educators and leaders of education systems should make explicit and visible their goals for well-being, and pursue strategies that help maintain well-being in the face of a global health event that will have a considerable toll in the lives and health of individuals… As such impact becomes proximal to every learner and educator, this may impact their motivation and functioning. (Reimers and Schleicher, 2020:7f).

At the time of writing this paper, a discussion is ranging in the press and on teacher groups in the social media concerning the coverage of a story where a teacher has been giving lessons from her hospital bed following a surgery. While many news outlets were portraying the action as a model and inspiration, most teachers have rightly expressed frustration at the unhealthy, dystopian expectations of a broken education system. Teachers deserve a humanistic approach, especially during the added strain of emergency remote instruction. Our respondents commented: "Thank you for sharing this survey! I enjoyed completing it, and thought it was one of the more comprehensive and compassionate surveys I've done during this time."; "Just completed this survey and I too would HIGHLY recommend that you spend some time completing it. It's LONG as surveys go, so grab yourself a good cup of tea/coffee and some nibbles and find yourself a quiet space, it's going take over half an hour, but I can safely say I have never felt that a survey could be life affirming but this is! It actually made me feel better. It's like your own personal therapist at these difficult times. Thank you! Well done." and "I was able to relate all the questions to my experiences. I appreciated that the survey seemed to focus on the educator as a whole person rather than just a 'provider of lessons and materials,'" underlining the importance of seeing teachers in a holistic and humanistic manner.

Despite the challenges of emergency remote teaching, HE instructors are in a privileged position compared with most of their counterparts teaching at lower levels of education, as the education level handled has already turned out to be a significant predictor of coping and engagement (Jelińska and Paradowski, 2021a).

The post-pandemic world may see the trend of classes becoming more blended (Bozkurt, 2019; Kim, 2020), integrating conventional face-to-face instruction with online learning (Garrison and Kanuka, 2004; Dziuban et al., 2018). The "new normal" will hopefully remove most of the current stressors, but awareness of the variables influencing teacher coping and well-being will be nonetheless be useful to both teachers and administrators.

One of the obvious limitations, shared by most large-scale surveys, is the issue of participant self-selection. Given that participation in this study was completely voluntary, and that on many occasions the questionnaire took upwards of 45 min to complete, the respondents were already motivated, could relate to the topic, and had the spare time and technology to comfortably fill it out. This means a limit on the representativeness and generalization potential of the data and resultant findings (see Brown, 2001:85).

This university instructors' perspective will be complemented with later publications on other relevant aspects of educators' adaptation to the transition, as well as analyses of students' points of view.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: The data are part of a larger project still in progress. Requests to access these datasets should be directed to MBP, https://schoolclosure.ils.uw.edu.pl.

ETHICS STATEMENT

AUTHOR CONTRIBUTIONS

MBP conceptualized the study, designed the survey instrument, piloted and administered the data collection, and contributed to the interpretation of the data and the writing of the article. MJ contributed to the survey instrument, carried out the quantitative analyses, and contributed to the writing of the article. Both authors approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.643229/full#supplementary-material

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COVID-19 Beliefs, Self-Efficacy and Academic Performance in First-year University Students: Cohort Comparison and Mediation Analysis

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Students' learning contexts can influence their learning beliefs and academic performance outcomes; as such, students studying during the COVID-19 outbreak may be at risk of negative impacts on their academic self-efficacy and subject grades compared to other cohorts. They may also have specific beliefs about the impact of COVID-19-related changes on their capacity to perform, with potential consequences for self-efficacy and academic performance. Two weeks after the COVID-19-related transition to online-only learning, 89 first-year psychology students completed a measure of academic self-efficacy and indicated how they thought COVID-19-related changes would impact their capacity to perform in a psychology subject. At the end of the semester, subject grades were obtained from institutional records. Contrary to expectations, neither the self-efficacy beliefs nor the subject grades of the 2020 cohort were significantly different from those of a sample of 2019 first-year psychology students ($n = 85$). On average, 2020 students believed that COVID-19-related changes to their learning environment had a negative impact on their capacity to perform well. A mediation analysis indicated that students' beliefs about the impact of COVID-19 on their capacity did not directly, or indirectly (*via* self-efficacy), predict grades. The only significant association in the model was between self-efficacy and grades. Although students reported believing that COVID-19-related changes would negatively impact their capacity to perform, there is little evidence that these beliefs influenced their academic self-efficacy or academic performance or that studying during the COVID-19 outbreak disadvantaged students in comparison with the previous years. A follow-up analysis indicated that self-efficacy was a stronger predictor of grades in the 2020 cohort than in the 2019 cohort. While there may be several unmeasured reasons for cohort differences, one potential interpretation is that, in the context of uncertainty associated with COVID-19, self-efficacy beliefs assumed relatively greater importance in terms of mobilising the resources required to perform well.

Keywords: COVID-19, higher education, University, self-efficacy, confidence, academic performance, student, grades

INTRODUCTION

COVID-19, the first coronavirus to be declared a global pandemic (World Health Organization, 2020), has caused unprecedented disruption in many life domains. In order to reduce the spread of coronavirus, many universities around the world made an abrupt transition from face-to-face to online and remote learning (Ali, 2020; Aristovnik et al., 2020; Centers for Disease Control and Prevention, 2020; Coyne et al., 2020). Many institutions currently continue to either teach fully online or use hybrid models (Walke et al., 2020). Students in higher education are considered a particular risk group for COVID-19-related impacts (Xiong et al., 2020). In this context, university students who have been studying during the COVID-19 outbreak are potentially vulnerable to negative effects on academic outcomes, such as grades, as well as on important academic beliefs, such as self-efficacy.

COVID-19-related changes have disrupted students' lives in many ways. Research reviewed by Aristovnik et al. (2020) indicates that students have experienced changes to their habits and daily routines, reduced social contact and support, and financial impacts. Campus closures have decreased access to libraries and other face-to-face supports (Patricia Aguilera-Hermida, 2020), as well as to internet facilities, printers, and other essential equipment and services (Aristovnik et al., 2020). Many students' new at-home study environments are not conducive to focused work, often being shared spaces characterised by noise and distractions (Patricia Aguilera-Hermida, 2020). In fact, more than half of students in a global study reported that they did not have a quiet place to study (Aristovnik et al., 2020).

Students who had to abruptly and involuntarily transition to online learning may not have been well equipped to function successfully in their new learning environment. The need to adapt to an unanticipated – and perhaps undesired – way of learning may impact performance outcomes because of a lack of confidence in, certainty about or acceptance of, online learning (Mäkitalo et al., 2005; Tarhini et al., 2017; Sollitto et al., 2018; Bower, 2019). Underdeveloped self-regulation skills may also be a concern, given how important self-regulation skills are for online learning generally (Broadbent and Poon, 2015; Aristovnik et al., 2020) and that online learning potentially requires the application of different types of self-regulation skills compared to face-to-face study (Broadbent, 2017). Students may also have lacked the time management and IT skills to engage effectively with learning materials delivered in the online format (Aristovnik et al., 2020; Patricia Aguilera-Hermida, 2020). Students have also reported that they anticipated less success in communicating with their teachers and classmates as a result of remote learning (Patricia Aguilera-Hermida, 2020), which is of concern in the COVID-19 context given that students rely on peer communication to manage academic uncertainty (Sollitto et al., 2018) and the role that social support and information sharing have in facilitating student resilience and adaptation (Wilks, 2008).

Alongside these practical impacts on students' learning experiences, public health emergencies also carry widespread mental health implications. Research indicates that the outbreak of COVID-19 has been accompanied by negative psychological effects, including increased feelings of stress, and increased symptoms of anxiety and depression (Brooks et al., 2020; Salari et al., 2020; Taylor et al., 2020). In many cases, these effects are believed to reach thresholds for clinical significance in the general population (Xiong et al., 2020). High levels of uncertainty are associated with academic stress (Akgun and Ciarrochi, 2003) and a higher prevalence of mental disorders (Wu et al., 2020), both of which are negatively predictive of academic performance (Bewick et al., 2010; Bedewy and Gabriel, 2015). Students around the world surveyed during COVID-19 lockdowns have reported increased stress, anxiety and worries, as well as boredom, frustration and a lack of motivation (Aristovnik et al., 2020; Cao et al., 2020; Patricia Aguilera-Hermida, 2020). For example, Liu et al. (2020) reported that Chinese students' anxiety and depression levels during the COVID-19 outbreak were higher than national norms. Research by Lechner et al. (2020) in the United States indicated that students' alcohol consumption increased following university closures. A majority of French students surveyed during a period of COVID-19-related confinement reported increased anxiety and moderate-to-severe stress (Husky et al., 2020). COVID-19, like other public health epidemics, is seen as a chronic stressor, potentially resulting in significant changes to thoughts, feelings and behaviours (Liu et al., 2020) across multiple domains of functioning, including the academic context.

While some degree of arousal is beneficial for learning, meta-analyses have shown that stress, depression and anxiety have a negative relationship with memory and academic performance overall (Seipp, 1991; Kizilbash et al., 2002; Richardson et al., 2012). Alongside the practical impacts of COVID-19 on learning experiences described above, it may also be anticipated that students' academic performance will suffer as a result of the psychological impacts of the COVID-19 outbreak. Commentary regarding the potential impact of COVID-19 on learning outcomes paints a bleak picture consistent with this prediction (e.g. Aucejo et al., 2020; Dorn et al., 2020). However, empirical findings are mixed in this regard. For example, one study with United States students showed that, although students expected to perform more poorly and reported decrements in terms of knowledge, concentration and engagement, actual grades were unchanged (Patricia Aguilera-Hermida, 2020). Indeed, it has even been reported that academic performance in higher education is positively influenced by COVID-19, with Spanish students impacted by COVID-19 performing better than students in a previous cohort (Gonzalez et al., 2020). Further research is needed to explore how COVID-19 has impacted academic performance outcomes in additional samples.

The COVID-19 pandemic also has potential implications for students' academic beliefs. Self-efficacy, a key construct in social cognitive theory, is an individual's "can do" belief about a future performance outcome (Bandura, 1997). In academic settings, self-efficacy is widely believed to be one of the most important non-intellective predictors of achievement. Meta-analyses of the relationship between self-efficacy and academic performance consistently demonstrate a positive association

between the two (e.g. Multon et al., 1991; Honicke and Broadbent, 2016). For example, Richardson et al. (2012) identified self-efficacy as the strongest correlate (ρ = 0.59) of grade point average (GPA) from 42 non-intellective antecedents of performance from 13 years of research. A systematic review of meta-analyses showed that self-efficacy was the strongest student-related predictor of achievement in higher education (d = 1.81; Schneider and Preckel, 2017). Other meta-analyses have shown that self-efficacy remains a positive, albeit modest, predictor of academic performance when previous academic performance is taken into account (Valentine et al., 2004; Talsma et al., 2018).

A key issue in terms of the impact of COVID-19 on self-efficacy beliefs is that emotional states are identified as a source of these types of judgements (Bandura, 1997). Individuals are believed to use their own feelings of arousal, uncertainty, anxiety, stress and fatigue as cues in judging their own efficacy (Usher and Pajares, 2006). For example, low levels of arousal (feeling calm) may be interpreted as compatible with a sense of personal competence. In contrast, feelings of distress or other strong negative emotions regarding academic tasks can undermine beliefs about capability and decrease performance expectations. As such, a student experiencing study-related distress associated with COVID-19-related changes to their learning context may interpret this distress as an indication of vulnerability to perform poorly (Bandura, 1995). It is well established that academic self-efficacy and anxiety are negatively related (Pintrich and De Groot, 1990; Rouxel, 1999), with both meta-analyses (Preiss et al., 2006) and recent research in the COVID-19 context supporting this pattern of association (Alemany-Arrebola et al., 2020). With a growing number of studies showing heightened anxiety (as well as depression, frustration and boredom) during the COVID-19 outbreak (Aristovnik et al., 2020; Cao et al., 2020; Patricia Aguilera-Hermida, 2020), there is the potential for self-efficacy beliefs to be negatively impacted. While some research suggests that self-efficacy beliefs are resistant to external influences (e.g. Bong, 2002; Foster et al., 2016), there is also evidence that they can change in response to interventions (e.g. Bergey et al., 2019) and over time (e.g. Talsma et al., 2020). As such, we anticipated that the unprecedented practical and psychological impacts of COVID-19 would be reflected in lower academic self-efficacy beliefs for 2020 university students than comparable cohorts.

There is some emerging evidence to suggest this may well be the case. When facing the challenges outlined above, students have reported expecting to perform more poorly in their academic work because of the impact of COVID-19 (Aucejo et al., 2020; Patricia Aguilera-Hermida, 2020). For example, more than 50% of students at a United States university expected their GPA to be negatively impacted by COVID-19 (Aucejo et al., 2020), while only 7% of students believed their grades would be positively impacted. Similarly, students from another US university surveyed during the COVID-19 pandemic reported that, compared to before the outbreak, they expected to perform more poorly in their classwork and have more difficulty submitting assignments on time (Patricia Aguilera-Hermida, 2020). While students have reported that they expect to face academic challenges as a result

of COVID-19, there is no study to our knowledge which has measured self-efficacy beliefs during COVID-19 using a standardised instrument and compared scores to an analogous previous cohort.

The current study contributes to an emerging field of research exploring the impact of COVID-19 on the university sector. Limited research has explored how the distressing context of COVID-19 may impact university students' self-efficacy beliefs. Likewise, the practical and psychological implications of COVID-19 may impact students' academic performance outcomes. While a very small number of studies have considered relationships between self-efficacy and other variables during COVID-19 (e.g. Alemany-Arrebola et al., 2020), none, to our knowledge, compared the self-efficacy beliefs of students impacted by COVID-19 to those of students not impacted by COVID-19. At the same time, commentary and research around the impact of COVID-19 on academic outcomes have yielded mixed results, and additional research is needed. Thus, the first aim of the current study was to compare the self-efficacy beliefs and academic performance outcomes of 2019–2020 cohorts of students studying the same course. It was hypothesised that the self-efficacy beliefs and subject grades of 2020 students would be significantly lower than those of 2019 students.

Further to the above aims, it is also important to explore how 2020 students' beliefs about the impact of COVID-19 on their performance capacity relate to other key academic variables. A small number of previous studies have examined student beliefs regarding the impact COVID-19 will have on their performance (Aucejo et al., 2020; Patricia Aguilera-Hermida, 2020), but there are no studies, to our knowledge, which assess how these specific beliefs predict broader self-efficacy judgements or academic performance outcomes, such as grades. Therefore, the second main aim of the current study was to conduct such an investigation. It was hypothesised that COVID-19 beliefs would predict academic performance outcomes, both directly, and indirectly *via* their influence on self-efficacy beliefs.

MATERIALS AND METHODS

Participants

Participants were 89 first-year undergraduate students (69 female) studying introductory psychology in semester 1, 2020 at a regional Australian university. Participants' ages ranged from 18 to 51, with an average age of 23.5 years. The sample was predominantly Australian (76 students).

Data from the participants in the 2019 comparison cohort (85 students, 60 female) had been collected for a previous research project. These students were also studying introductory psychology in semester 1. Participants' ages ranged from 18 to 64 (M = 24.6). This sample was also mostly Australian (75 students).

Procedure and Measures

Participants were invited by email to complete an online questionnaire containing the below measures, which took approximately 15 min to complete. The online questionnaire

was open for a period of 10 days in early April 2020, beginning approximately 2 weeks after COVID-19-related teaching and learning changes (e.g. transition to online classes) began. The Human Research Ethics Committee of the authors' institution reviewed and approved the project. Participants received course credit for participating.

Self-Efficacy was measured using a 7-item scale adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) self-efficacy subscale (Pintrich and De Groot, 1990). Participants indicated their perceived capability of overall performance in their specified subject on a 7-point Likert scale ranging from 1 = not at all true of me to 7 = very true of me (e.g. "I am confident in my ability to receive an excellent grade in this class"). The MSLQ has demonstrated good predictive validity of future academic performance (Pintrich et al., 1993) and original psychometric testing showed a Cronbach's α of 0.93 (Pintrich and De Groot, 1990).

A single item asked participants to indicate what impact they believed the COVID-19-related changes to their university context would have on their capability to perform in their studies. Participants answered on a 5-point semantic-differential scale ranging from 1 = strongly negative impact to 5 = strongly positive impact.

Academic performance scores reflected students' subject grades (0–100) in an introductory psychology subject. Subject grades were based on scores on tests/exams as well as on assignments assessed using standardised assessment rubrics. Participants provided their consent for questionnaire responses to be matched with grades obtained from institutional records.

Participants also indicated their age, sex and nationality.

Power

While our primary goal in the circumstances was to recruit as many participants as possible within the limited window available, we considered the following in terms of our sample. For mean differences in self-efficacy and academic performance between the 2019 and 2020 cohorts, a calculation using G*Power 3.1 (Faul et al., 2007) indicated that a sample size of 60 participants per group would be required to detect medium effects. For the mediation analysis, the recommendation to recruit a sample of at least 50 participants plus 8 per variable suggested a sample size of at least 74 participants (Tabachnick et al., 2007).

RESULTS

All analyses were conducted in jamovi (The jamovi project, 2020). Preliminary independent-samples t-tests indicated that the self-efficacy, COVID-19 beliefs and academic performance outcomes of Australian students did not differ significantly from those of students with other nationalities, and there were no differences between males and females. For the self-efficacy scale, both Cronbach's α and McDonald's ω (argued to be a better alternative; Peters, 2014; Deng and Chan, 2017) for the current sample were 0.93.

Table 1 shows the means, standard deviations and correlation matrix for the key study variables for 2020 students. There was

TABLE 1 | Correlation matrix, means (SDs) on the diagonal.

	COVID-19 beliefs	Self-efficacy	Academic performance
COVID-19 beliefs	2.09 (0.98)		
Self-efficacy	0.122	5.08 (1.01)	
Academic performance	0.088	0.294**	71.9 (17.30)

$**p < 0.01$.

no final grade data available for four students; these students were excluded pairwise from analyses involving grades.

COVID-19 Beliefs

A one-sample t-test comparing the mean COVID-19 beliefs score to a test value of three (reflecting the scale midpoint value of neutral impact) indicated that students believed, on average, that COVID-19-related changes to their learning context would have a negative impact on their capacity to perform, $t(88) = -8.72$, $p < 0.001$, with a large effect, $d = 0.925$. Of the whole sample, 52 students (81.6%) believed that the COVID-19-related changes would negatively impact their capacity to perform [22 students (24.7%) strongly so]. Five students (5.7%) indicated that they believed COVID-19 would have no effect on their capability, while 11 students (12.6%) believed that the changes would have a positive impact on their ability to perform [three students (3.4%) strongly so].

2019 and 2020 Cohort Comparison

The self-efficacy beliefs of students in the 2020 cohort did not differ significantly from those in the 2019 cohort ($M = 4.76$, $SD = 1.22$), $t(172) = 1.859$, $p = 0.065$. We note that Cohen's d for this test indicated a small effect size ($d = 0.282$), with mean self-efficacy scores of 2020 students exceeding those of 2019 students, contrary to expectations. Grades for 2020 students also did not differ significantly from those of 2019 students ($M = 73.31$, $SD = 17.34$), $t(167) = 0.650$, $p = 0.516$, $d = 0.10$. Mann-Whitney U-tests were also conducted to address potential concerns regarding violation of assumptions of the Student's t-tests; non-parametric test results were substantively consistent with the above (Self-efficacy: $U = 3,155$, $p = 0.059$; Grades: $U = 3,312$, $p = 0.417$).

Mediation Analysis

As shown in **Figure 1**, students' beliefs about the impact of COVID-19 on their performance capacity did not predict overall academic self-efficacy beliefs ($z = 0.777$, $p = 0.437$), nor did they directly ($z = 0.740$, $p = 0.459$) or indirectly ($z = 0.734$, $p = 0.463$) predict academic performance outcomes. The only significant relationship in the model was the prediction of academic performance by self-efficacy ($z = 2.376$, $p = 0.018$).

Comparison of Correlations

As a follow-up, we conducted an unplanned comparison of the correlations between self-efficacy and academic performance across cohort years. For the 2019 sample, there was no significant

FIGURE 1 | Prediction of academic performance by COVID-19 beliefs *via* self-efficacy. *$p < 0.05$.
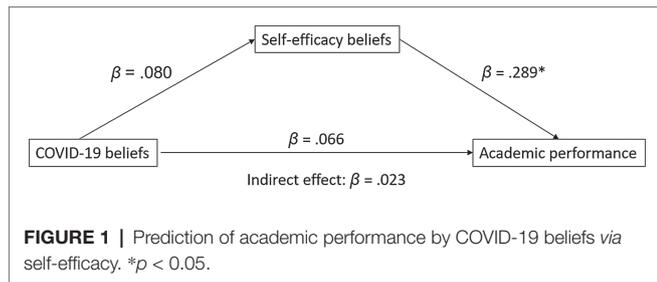
correlation between self-efficacy and academic performance, $r(85) = 0.172$, $p = 0.116$. For the 2020 sample, there was a moderate positive correlation, $r(86) = 0.413$, $p < 0.001$. We investigated the differences between correlations using the cocor package (Diedenhofen and Musch, 2015) in R (R Core Team, 2013). There was no statistically significant difference between the two correlations, $z = -1.692$, $p = 0.091$ (two-tailed). Also, the 95% of the confidence interval for the difference between the two correlations (−0.508, 0.038) included zero (Zou, 2007). Thus, we could not reject the null hypothesis of no significant difference between the correlations. However, interpreting the difference between the two r-to-Z transformed correlations yielded a Cohen's q of 0.265, suggesting a medium effect for this comparison, and we note that a G*Power analysis (Faul et al., 2007) suggested a much larger sample size ($n = 178$ in each group) would have been necessary for an effect of this size to be deemed statistically significant.

DISCUSSION

This study compared the self-efficacy beliefs and subject grades of the 2020 cohort of introductory psychology students which was impacted by COVID-19 with those of a comparable 2019 cohort. Contrary to expectations, there were no significant differences between the two cohorts on these two variables. We further anticipated that 2020 students' beliefs about the impact of COVID-19 on their capacity to perform would inform self-efficacy beliefs and also predict academic performance directly and indirectly (*via* self-efficacy). While students believed, on average, that COVID-19-related changes to their learning environment would have a negative impact on their capacity to perform, these beliefs did not predict either self-efficacy more broadly or subject grades.

Interpretation: Academic Performance

It had been anticipated that the practical and psychological upheaval associated with COVID-19 would be associated with poorer academic outcomes in the 2020 cohort. It was also expected that beliefs about the impact of COVID-19 would predict academic outcomes. It is not possible to determine exactly why these expectations were not supported, but the following considerations may be relevant. On the one hand, it is possible that the anticipated negative impact of COVID-19 on academic performance was simply not borne out in our sample. Our findings are consistent with the small amount of previous research which suggests that students have negative

expectations related to COVID-19 specifically, but that these are not necessarily matched by objective academic performance outcomes (Gonzalez et al., 2020; Patricia Aguilera-Hermida, 2020). One interpretation of this is that COVID-19-related changes were not sufficiently impactful to influence performance outcomes. While predictors of academic success have been of interest to psychology and education researchers for more than a century, much research suggests that academic performance remains consistent over time (Talsma et al., 2018, 2019a) and that stable factors, such as genes, demographics, socio-economic status, parental educational background, intelligence and prior achievement, are the primary predictors of academic outcomes (Stegers-Jager et al., 2015; Rimfeld et al., 2018; von Stumm et al., 2020). While research regarding a wide range of malleable psychosocial predictors of academic performance has also proliferated, scholars have recently cautioned against overstating the potential impact that environmental differences and non-cognitive factors can have on individual capacities and real-world outcomes (Moreau et al., 2019). In the context of strong predictions of academic outcomes by the stable factors outlined above, it may simply be that the COVID-19-related changes to students' learning environment did not reach an impact threshold whereby academic performance outcomes were affected. This may also explain why COVID-19 beliefs, in spite of their salience to students, were independent of objective performance results in our sample. Our findings are also consistent with the previous research showing that academic outcomes are not differentiated by course delivery mode (e.g. Cavanaugh and Jacquemin, 2015).

On the other hand, in terms of the finding of no grade differences between cohorts, there is a range of plausible alternative explanations. For example, it is not possible to rule out the potential influence of steps taken at an institutional level to buffer the anticipated negative impact of COVID-19 on students' experiences. In the case of the institution where this research was conducted, for example, a COVID-19-specific policy was in place to provide more flexibility around applications for extensions to assignment deadlines. In the absence of such policies, academic performance outcomes may have suffered. It is also possible that unmeasured changes, such as the amount of effort expended on studying, could have influenced these results. It is plausible that a desire to reduce anxiety led to increased effort devoted to studying, or that a reduction in social activities or un-/under-employment associated with COVID-19-related changes meant that more time was available for students to study. There is some evidence that COVID-19 impacted the number of time students spent studying, with some studying much more than usual, and others studying much less (Aucejo et al., 2020). It is thus possible that, while average grades could not be differentiated across cohorts, individuals responded to the situation differently, with impacts on who exactly received what grade.

Interpretation: Self-Efficacy

As with academic performance, there was no evidence of cohort differences in self-efficacy beliefs. This was contrary to expectations

and inconsistent with reports of students' diminished performance expectations during COVID-19 lockdowns (e.g. Aucejo et al., 2020; Patricia Aguilera-Hermida, 2020). Potential explanations for this lack of effect mirror those regarding academic performance in many respects. For example, while self-efficacy is theoretically domain- and context-specific and thus considered to be subject to variations within individuals and over time (Bandura, 1997; Bong and Skaalvik, 2003), there is some evidence that established self-efficacy beliefs are resistant to change and may not be as responsive to contextual determinants as theory suggests, as noted above (Bong, 2002). Several studies suggest that when beliefs about academic performance capacity are measured on multiple occasions over time, even when there are many opportunities for feedback and monitoring in-between measurements, correlations between repeated measurements are consistently strong (Bong, 2001, 2002; Hacker et al., 2000, 2008; Foster et al., 2016). In support of this, a meta-analytic cross-lagged panel analysis of the relationships between self-efficacy and academic performance over time showed that the previous self-efficacy was a very strong predictor of subsequent self-efficacy (Talsma et al., 2018). The present findings suggest that self-efficacy beliefs may not be strongly impacted even in the case of extreme changes to external circumstances; however, we note that a within-subjects design would be needed to confirm this. It has also been noted that university students are often overconfident with regard to their self-efficacy beliefs (Talsma et al., 2019b, 2020). As such, it is possible that the anticipated impact of COVID-19 was insufficient to disrupt students' tendencies to express strong confidence in their capacities. Another potential explanation for this unexpected finding is that part of the rationale for hypothesising lower self-efficacy in the 2020 cohort rested on the fact that emotional states and moods are a theorised source of self-efficacy beliefs. In the context of established negative psychological impacts of COVID-19, this expectation was defensible. However, in empirical studies, emotional states and physiological arousal tend to show a negligible or trivial influence on self-efficacy beliefs, while mastery experiences or performance accomplishments – which are, again, more stable – are believed to be the primary source of such judgements (Usher and Pajares, 2008; Phan, 2012). The lack of differences observed across cohorts, and the lack of influence of beliefs about COVID-19 on self-efficacy suggest that established self-efficacy beliefs tend to be stable and are not strongly influenced by changes in context.

Having said that, we noted above that institution-level response to the COVID-19 crisis may have impacted students' academic performance outcomes, and there is also the possibility that students' self-efficacy beliefs were buffered by such policies, which were implemented and communicated to students shortly prior to data collection for this study. However, if this was the case, such buffering would likely have also influenced responses to the question about the impact of COVID-19-related changes on the capacity to perform. We note that, in the structure of the questionnaire, students were asked about the impact of COVID-19 after they were asked about self-efficacy. The reason for this is that it was believed that, by bringing the potential threat of the pandemic to students' minds, the COVID-19 question

could introduce expectancy effects that might influence subsequent responses. It may be that COVID-19 beliefs and self-efficacy beliefs were unrelated because students' self-efficacy judgements were made independently of thoughts about COVID-19 and based on traditional patterns of responding which emphasise the stability of self-efficacy and overconfidence as outlined above. Meanwhile, it is possible that making COVID-19 salient to students prompted defensive pessimism, proactive external attributions or anticipatory cushioning to protect self-worth against possible negative outcomes (Norem and Cantor, 1986a,b; Campbell and Sedikides, 1999; Sedikides et al., 2004; Weiner, 2010). As with academic performance outcomes, we note that it is possible that we saw no difference in mean self-efficacy beliefs across cohorts because some students' beliefs were negatively impacted by the COVID-19 context, while others were positively impacted. For example, the self-efficacy beliefs of some students may have decreased in line with our hypothesis, but institutional and teacher communications with students designed to provide reassurance may have buffered the beliefs of other students, considering that verbal persuasion is also a source of self-efficacy beliefs (Bandura, 1997; Usher and Pajares, 2008).

Interpretation: Relationship Between Self-Efficacy and Academic Performance

The finding that self-efficacy was positively predictive of grades in the path analysis is consistent with previous research as outlined above. It was also found that the correlation between self-efficacy and academic performance was larger in the 2020 cohort than in the 2019 cohort. While this difference was not statistically significant, we note that the analysis was underpowered, and the effect size was medium in magnitude. Thus, while further evidence is needed, it appears plausible that a meaningful effect may exist. One potential interpretation of this is that, when faced with the pandemic situation, self-efficacy beliefs exerted an influence on how students appraised the potential impact of COVID-19 (e.g. fostering an appraisal of challenge rather than threat) and on choices they made about how to engage with their learning (e.g. prompting adaptive learning behaviours like setting high goals; Bandura, 1997). In the "business-as-usual" case of the 2019 cohort, self-efficacy beliefs may have exerted a lesser influence.

We note that the sizes of the effects of the self-efficacy/ performance relationship described above do not take into account cognitive ability or previous academic performance. The size of the effects would likely be attenuated if this had been the case, because in the reciprocal relationship between self-efficacy and academic performance, the unique effect of self-efficacy on performance is small (Valentine et al., 2004; Talsma et al., 2018, 2019a).

Limitations

There are a number of limitations which impact the interpretation of findings in the present study. For the most part, these relate to unavoidable issues associated with the COVID-19 situation and with comparing different cohorts of students.

First of all, in order to begin collecting data in as timely a fashion as possible, we prepared and sought urgent ethical approval for a single-item measure of students' beliefs about the impact of COVID-19 on their capacity to perform academically. Single-item measures are subject to criticism (e.g. Diamantopoulos et al., 2012); however, we note that recent studies support their validity and utility in research (e.g. Hoeppner et al., 2011).

The need to collect data within a specific time period during the COVID-19 shutdown limited the sample size we were able to recruit. Our inability to reject null hypotheses in both the cohort comparison and mediation analysis may suggest that insufficient power is a concern. Our power analyses were based on medium effects; however, several small or trivial effects were noted and these would not have reached statistical significance without considerably larger sample sizes. However, we note that the small self-efficacy effect that we reported is in the opposite direction to that hypothesised, which provides some indication that the COVID-19 context in 2020 was not accompanied by a *negative* impact on self-efficacy beliefs. In terms of the mediation model, while the trivial effects of COVID-19 beliefs on self-efficacy and academic performance may have reached statistical significance with a much larger sample, it seems unlikely that effects of the magnitude identified (i.e. $\beta = 0.080$ and smaller) would be considered meaningful.

A limitation of cohort studies, in general, is the potential for influences of unmeasured confounding variables. This concern is potentially compounded in the present case, as the pandemic situation was evolving rapidly at the time data was collected. It is not possible to explicitly determine the effect of COVID-19 on outcomes using the between-group cohort comparison design necessitated by the real-world setting of this research. While this approach has some benefits in comparison with studies which have asked students to retrospectively self-report pre-COVID-19 feelings, beliefs and behaviours, our findings should be interpreted with caution. For example, while assessments in both cohorts were either marked by computer or based on standardised rubrics and subject to moderation, it is unknown to what degree assessors consciously or unconsciously adjusted their marking practices to take into account anticipated negative impacts of COVID-19 on performance. As well as the possible impact of unknown differences between cohorts, we also note that there were known differences between cohorts which cannot be quantified in our analysis. For example, while subject content and teaching staff remained the same across the two cohorts, there were changes in assessment between 2019 and 2020 (e.g. written assignment topic change, minor assessment weighting changes and move to online exams because of COVID-19 distancing requirements). COVID-19-related institutional policy changes have also been referred to above.

Several issues may also have impacted the data and we had available for analysis. For example, it is possible that students for whom final grades were unavailable could have received lower grades, reducing the average performance score. We focused on a single subject of study, but it is possible

that participants may have received higher or lower grades in other subjects, or their courses overall. There is also a potential risk that students with lower self-efficacy beliefs and poorer grades did not participate in the study. For example, students experiencing the greatest negative impacts of COVID-19 may not have volunteered to participate in the study or may have already withdrawn from the subject when questionnaire invitations were sent. We note, however, that students in all cohorts experience stresses and challenges; the 2019 sample may have been influenced by similar issues as well. One other point to consider is that the use of identical measures for self-efficacy in both cohorts may mean that scores are subject to common method bias (see e.g. Spector, 2006).

Some comments are merited regarding the characteristics of the present sample, as they may affect the interpretation and generalisability of these findings. Our sample was potentially, especially vulnerable to negative impacts of COVID-19 because of its makeup. For example, participants were mostly female, mostly young adults and, naturally, all students. All of these characteristics have been identified as risk factors for negative outcomes relating to COVID-19 (Xiong et al., 2020). In addition, the university where the research was conducted is located in the southern hemisphere, where university students have been identified as potentially particularly susceptible to negative outcomes, given that the lockdown began early in the new academic year for these students (Aristovnik et al., 2020). Several scholars have also noted the potential difference in COVID-19 impacts depending on socio-economic status, which may result in the exacerbation of digital and economic inequalities in student populations (Aristovnik et al., 2020; Dorn et al., 2020). While the institution where this research was conducted is located in a western and industrialised nation, the specific location is a regional area identified as having the highest proportion of people living in the most disadvantaged areas of the country, and vice versa (Australian Bureau of Statistics, 2016). Thus, while we note several potential limitations to the present research above, in the context of anticipated vulnerabilities of the sample, the lack of significant findings may be considered noteworthy. Conversely, we note that the particularities of the present sample may limit the generalisability of findings to similar student samples.

Conclusion

Overall, while 2020 students believed that COVID-19-related changes to their learning context would negatively impact their capacity to perform academically, neither their self-efficacy beliefs nor their academic performance outcomes differed from a comparable 2019 cohort. Furthermore, 2020 students' beliefs about COVID-19 did not directly predict performance outcomes or self-efficacy beliefs, nor did they indirectly predict performance outcomes *via* self-efficacy. This provides some comfort that perhaps not all of the bleak predictions associated with COVID-19 will be borne out; both subject grades and self-efficacy beliefs may have been buffered by policies with this end in mind, or they may more generally be resistant to the impact of variations in the environmental context.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Human Research Ethics Committee of the University of Tasmania. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

KT conceived of the project with input from KN. KR and CT undertook data collection under the supervision of KT. KT conducted statistical analyses and wrote the manuscript with input from KR and KN. All authors contributed to the article and approved the submitted version.

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Covid-19 (in) a Class of Its Own: Student and Teacher Musings Regarding Their Learnings and Well-Being when Moving a Large Blended First Year Class Virtually Overnight

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Covid-19 is (in) a class of its own in its influence on human lives and livelihoods globally, precipitating steep learning and psychological well-being curves for university teachers and students. This has impacted dramatically on the conditions under which higher education has had to function in regard to research and what is now referred to as 'emergency online education'. As staff face unprecedented challenges, so too do students. Given that the consequences of these times are likely to be felt well into the future, it is important to capture what is happening now. We therefore present this perspective piece comprising 13 musings co-authored by students and educators regarding our experiences of two lockdowns within Aotearoa New Zealand in 2020 representative of the disrupted university in its adjustment to learning and teaching. In contributing to calls to develop a post-pandemic pedagogy for higher education, and better support staff and student well-being, we draw on methods that would multiply questions and invoke possibilities, as an impetus for reimagining higher education. Making use of a cogenerative dialoguing process, these musings enable multiple voices to be heard and considered. A non-representational lens enables us to explore the *what* and *how* of Covid-19 creating disruption and uncertainty for students' and educators, influencing their psychological well-being and higher education pedagogy and practices, and becoming a contextually relevant taonga (treasure) of experiences that might inform future educational activities.

Keywords: cogenerative dialoguing, Covid-19, flexible learning, higher education, on-line learning

INTRODUCTION

"We are surrounded by a pragmatic discourse that would have us adapt to the facts of reality" (Freire, 2014, p.1). Our current reality with Covid-19 and the impact this pandemic has had on educational institutions provides an example of a sudden adaptation, unplanned but necessary. In the words of Anderson (2020) Covid-19 necessitates a "pedagogical pivot" into digital learning spaces with unprecedented haste (Veletsianos and Houlden, 2019). This

occurs in a world of increasing digitalization, with education positioned as anytime anywhere. However, digitalization of education has also been considered problematic (Selwyn, 2010) and challenging (Naidu, 2017). Digital technologies constitute a new context for teaching and learning. While digital technologies are widely utilized within our university, the challenge discussed in this paper is when we are faced with nothing but such technologies mediating the learning and teaching relationship. Drawing on cogenerative dialoguing (Roth and Tobin, 2004) for a process that would open up conversation on experiences as well as making use of Thrift's (2008) non-representational approach, we present what has occurred without a metanarrative. We explore the experiences of educators and students within a large first semester, first year, university course of study in Aotearoa New Zealand; exploring the *what* and *how* of learning, teaching and well-being, as was impacted by Covid-19 lockdowns.

Literature Review

Educators have long been interested in pedagogy as ways of knowing as well as of doing and as educators we are encouraged by Freire's (2014) pedagogy of hope. Our endeavors during such challenging times are hope based in expanding possibilities for social justice. This necessitates creating a liberating, decolonized educational environment, given "there is no change without dreams, as there is no dream without hope" (p. 81). Such critical social theory as pedagogy values open education, self-directed learning and the like. Further, Daniels (2012) reminds us that patterns of social interaction within the cultures of educational institutions allow us to exert a formative effect on the *what* and *how* of learnings.

Disruptions to university education in response to Covid-19 have necessitated a pivot into digital pedagogy. Digital pedagogy is not about using digital technologies for learning and teaching per se but rather about approaching digital tools from a critical pedagogical perspective as a means to support desired educational practices and outcomes (Henderson et al., 2017). So, it is about using digital tools thoughtfully, deciding when not to use digital tools, and considering the impact of digital tools on learning (Beetham and Sharpe, 2013). Henderson et al. (2017) note that we need to think about how broader institutional practices and expectations are shaping the *what* and *how* of digital technologies in higher education. In this instance this involved a rapid response to the unprecedented reconfiguration required for learning and teaching to be rapidly situated fully online.

Contextualization

Our university in Auckland, Aotearoa New Zealand has had several decades of infrastructural developments to support elements of distance learning, however, on-line learning has never been the sole approach desired or implemented. While we recognize the values of digital technologies for enhancing learning and teaching, our university has not developed a culture nor identity as a distance education provider. Most of our programmes could never be solely offered online. Graduate profiles, and often professional regulatory bodies, require students undertaking bachelor's in health science, sport and recreation or science to learn how to undertake work with patients, in lab settings, and/or in the field.

In this paper we consider one large, compulsory *knowledge, enquiry and communication* course for all first-year students in our faculty, which has an enrollment of around 2000 students in first semester and 500 students in second semester. With such numbers, those enrolled reflect a diversity of cultures, ages, educational experiences, etc. Prior to New Zealand's first major Covid-19 outbreak this course occurred both on-campus and on-line using a flipped classroom approach, with only a small cohort of students engaging completely online. Our course has a strong culture of co-learning; educators learning with and from their students; and values diversity also in regard to knowledge construction. In 2020, both offerings of the course began in-person with some hybrid activities. However, by week four, at very short notice–virtually overnight, they were forced to shift completely online. These pedagogical pivots took place when the New Zealand government mandated closure of educational facilities and instructed people to stay at home in their bubble other that if they were essential workers or needed to access essential services.

METHODOLOGY

Our approach is very much one of aligning with a critical digital pedagogy because we are troubled by how our sudden changes in teaching and learning impact on our educational practices as educators and students. We identify as educators and students with Freire's (2014) pedagogy of hope. Freire called for us to change in how we relate to, and construct knowledge, with others, instead of about them. We aspire to relational, interactive and participatory ways of working even through such unplanned and sudden changes to our learning and teaching practices. As educators we continually evaluate our educational practices; and within this course students are encouraged to reflect on their learning. Making use of cogenerative dialoguing (Roth and Tobin, 2004) our intention is to mobilize improvement in higher education through valuing everyone's input; particularly enhancing the voices and agency of students alongside educators. Such a subversive methodology interrupts power and privilege for reimagining higher education environments, whereby musings are presented with equal importance given to each voice (Stith and Roth, 2006). It brings people together to really listen to one another, accepting both differences and commonalities. Situating ourselves as co-learners and co-creators of knowledge mirrors the learning outcome within the course that situates knowledge as constructed. A key component of our willingness to engage in cogenerative dialoguing is commitment to change (Roth and Tobin, 2004), because of our shared interest in contributing to authentic learning, teaching and curriculum development that would benefit all involved.

What follows are the musings of educators (Julie. Kelvin, Gema, Sheridan), students (Ana, Andrew, Thais) and our head of school (Ailsa), following two Covid-19 related campus closures and course completion. Sometimes we choose to muse alone, other times in pairs.

This is not a passive stance to the objective enquiry. Invoking Thrift (2014) we raise questions as to future possibilities for a new normal in higher education. Our musings have been ordered through metaloguing (Roth and Tobin, 2004) among all authors and follow a trajectory of course curriculum redesign from *what was (Julie's initial musings)* through to *what might be (Ailsa's musing)*.

MUSINGS

Imagining Teaching and Learning
Julie

I felt compelled to redesign the course for semester 1 2020, following a workshop with faculty stakeholders regarding contextualization within broader programmes of study. I took this risk one month before the start of semester. I changed learning outcomes, content and assessments. An in-class verbal assessment opportunity, previously identified as challenging by students, was redesigned so students could video and rerecord themselves. Immediacy of change was driven by my desires for assessments more contextualized to students' interests. I was confident in the flexibility of our teaching team. These changes preceded the announcement of Covid-19 as a Global Pandemic. I was oblivious to the serendipity of my decision.

Realities of Context and Pedagogical Pivot
Julie

Requests for flexible learning are not new. For decades, university students have balanced learning, earning and other commitments. Blended learning, through a flipped-classroom, was the old normal in our course. Voluntary weekly on-campus tutorials were designed for teachers to be guides on the side as students completed interactive activities. And, every semester a cohort of distance students studied the course entirely online. So on-line learning was not unfamiliar to our teaching team.

Thais

As a foreign student, with English not my first language, I didn't know what to expect from the course. I felt like an outsider; unsure and scared. However, I was determined to overcome those feelings and succeed. The first few weeks on campus were dynamic and fun. I was experiencing a different way of learning; interacting with people and feeling confident. It was an enjoyable challenge. However, four weeks into the semester, Covid-19 disrupted everything. New Zealand went into lockdown. AUT moved teaching online. Feelings of uncertainty hit me. Doubts haunted my mind. I am not a computer person, so I faced this challenge on top of everything else. I kept motivated by focusing on my final goal. The first 2 weeks of online teaching were stressful, but to my surprise staff made things easier than I was expecting. I figured out a plan to get through the semester by not allowing procrastination to take place and by keeping the same routine as if I was going into campus. I used the flexibility of studying from home and numerous university resources to keep on top of my work. So, although online learning was not what I signed up for, I still succeeded. It came with a lesson that things can change quickly, and we must adapt to the new situation with the best of our abilities. It is normal to feel scared and unsure. However, focusing on your final goal and reinforcing a plan by using the tools you have available will help you to achieve anything.

Andrew

Covid-19 was a driver in my successful first year of university. During my first four weeks of on-campus study I struggled to manage time. The first lockdown, and uncertainty around future study, made me quite anxious. As a busy adult student with bills to pay and three years of full-time study ahead of me, the idea of lost time was daunting.

During the break, brought forward by Covid-19, AUT announced we would resume courses from where we had left off–from home. Everything would be online. I swiftly realized that to complete work to a high standard, I would need immense self-discipline and focus, by myself, in my home: a place previously allocated for relaxation–university work was to be done in class, or at the library.

Self-motivated learning had never been a strong characteristic of mine. However, as courses progressed, online learning provided far greater flexibility than on-campus study. I was able to spread my workload, use online resources to dig deeper into subjects I struggled with, all at my own pace. I listened to lectures in the garden, while watering plants or weeding vegetables. With recorded material, I could mold my study week to focus on one subject at a time, which suits me incredibly well. After my first A+ result, I realized that online learning, was working for me, and the tough Covid-19 context fueled my urge to succeed.

Ana

Covid-19 lockdown brought technology challenges when attempting to participate in online tutorials. The internet connection was unreliable. The network sometimes overloaded, hindering my ability to follow conversations and engage.

However, being full time at home allowed more time to study and work without long trips across the city from home to work and to classes. I enjoyed the flexible online tutorial hours. I could attend any or multiple tutorial times. If unable to attend tutorials times, I could refer to recorded tutorials. With flexible work and study hours I accomplished more without compromising the quality of my study or work.

Kelvin

I was interviewed online and hired as a lecturer during lockdown. My transition to lecturer and joint course coordinator of a large course was marked by rapid increases in responsibilities. This

role, in uncertain times, was more challenging than I expected. Lockdown meant I was unable to have an orientation. My transition felt like I was thrown in the deep end.

Overcoming my fear of failure to tackle challenges led to opportunities to develop new skills and to innovate. I obtained information about regulations and processes, and advice about being a course coordinator, by asking the right questions and seeking mentorship. This cultivated relationships and opened communication channels with welcoming colleagues. A sense of community developed with online colleagues who I had yet to meet in person.

Close collaboration and agility of our teaching team was vital in the smooth transition into my role. Key strengths of our team were 1) trust to delegate and complete tasks, including management and moderation of up to 40 markers 2) shared enjoyment of team teaching, and willingness to learn from each other and take risks, and 3) empathy for students who were also navigating changes.

Gema and Julie
Videos allow students to demonstrate creativity and skills in multiple ways. Students submitted an audio-visual file relating to their understanding of knowledge enquiry. Video formats provide formative learning opportunities including self-review, re-recording and editing. This values student agency in developing self-evaluative judgements (Boud et al., 2018). Use of technologies arguably enhance digital literacy. In addition, videos provide a virtual connection with students. We could observe facial expression more clearly than in face-to-face presentations, and had the ability to control volume, pause, slow/increase speed, and re-listen, contributing to fair and reliable marking, and moderation processes.

Julie and Kelvin
We see Covid-19 as an unprecedented real-world contextually relevant example to thread throughout learning and teaching in health and environmental sciences. By mid-2020 there was no consensus on origins of the virus, its management and impact. In the students' course of study variable claims relating to sources of evidence and how knowledge is constructed could be explored. Over time data and information regarding Covid-19 and its impact continued to emerge, providing real time authentic learning.

We acknowledge that Covid-19 could be a sensitive topic, for teachers and students, especially while still amidst the global pandemic. At the same time, we don't expect teachers or students to ignore or forget what has happened. We discuss Covid-19 as a broad and complex issue that brings together different knowledges (technical, social, political).

Gema and Julie
Being online challenged identities and engagement of both learners and teachers. We became members of a large online learning community with both synchronous and asynchronous sessions: Gema's pre-existing distance students continued to attend their weekly session online. They remained highly engaged and welcomed new members.

Initial silence of the previously on-campus cohort seemed pronounced online, so we were deliberate to not fill the virtual void as "sages on stage". Online identities, engagement and learning evolved with time: teachers showed their faces, projected their voices and shared resources on screen–Julie even wore silly hats. Students participated by name or pseudonym, chat text, occasionally voice and rarely on camera. We did not restrict students' use of chat, annotation, microphone or video. Students could opt for anonymity. Over time, a collective identity emerged, increasing familiarity and engagement. "Banter" emerged among teachers and learners: sharing experiences and suggestions, reflecting on positives, celebrating achievements, joking, sharing laughter, and making light of technical issues.

Gema
Practicing kindness and building rapport traverses modes of learning and teaching and is essential to supporting students as they navigate their learning journeys. This provided focus for me during Covid-19. At the outset of each session, I shared something that had happened for me during the week, including a picture. I was the first person to share, promoting a space for others to feel comfortable. I would focus on a common experience and use open ended questions, such as, *what is your view like? - what got you through this week's lockdown?* Students responded using the microphone or chat text. Sharing built trust and rapport. Covid-19 offered opportunities for practices of kindness online.

Julie and Sheridan
As teachers of first-semester students we prioritize pastoral care. We promote well-being of ourselves and our colleagues. During lockdown we introduced *KEC Thrive* online synchronous sessions–a partnership of self-care and well-being to thrive. We present ourselves, teachers, as real people who too encounter daily challenges, which we can reimagine as possibilities to do things differently. Sheridan shared her own experiences of studying successfully online. Julie shared the turmoil of home becoming spaces of work and learning for her whanau (family). Sheridan's and Julie's fur babies, Jack dog and Shadow cat respectively, made guest appearances.

Some students and teachers spend lockdown alone, physically isolated. *KEC Thrive* provides a space to converse and connect, to share, listen, compare and empathize with each other's challenges and collaboratively solution-seek.

Reimagining Learning and Teaching
Ana
This experience highlights a need for universities to create a more flexible learning environment where students like me, returning after a long break from formal studies, or individuals looking to retrain while maintaining life responsibilities, can pursue higher education. I often hear from colleagues about their desire to pursue another area of interest but are unable due to the difficulty of balancing work, family and study commitments. Many companies are adopting flexible work environments, enabling

a less stressful and more balanced life. I hope that flexible work and study environments will continue so I can achieve my dream to prepare for a career that will allow me to do more for society.

These musings are highly insightful. It is interesting to read about the challenges others encountered and how learning and teaching are vastly different experiences for each individual. I wonder if it is not just flexibility that is required in the academic environment, but more customisation.

Ailsa

It took a pandemic to precipitate questioning of *what* it is we do and *how* best we might do it. The interruption to work as planned provoked consideration of educational philosophies and pedagogies. Similarly, this pandemic raised awareness that most everyone experienced unexpected and for some incredible stresses in their lives in their work and in their studies. The collective will to act with kindness and generosity is my takeaway on this. Oddly, I am left musing what is it about higher education or education experiences more generally that make acting with kindness and generosity noteworthy?

I feared for student results, given the stressors they were under and the stressors of my colleagues, and I am surprised at success rates that are higher than in previous years. Generosity and compassion being extended with generous allowance on assessment submission dates provided opportunity for students to submit work in circumstances that were challenging. Again, I'm left reflecting on this. What might we sustain or even extend upon?

Changing an assessment to an audio-visual upload reduced performance anxiety and allowed students to learn while undertaking the assessment task. And so, I ask myself, might learning during an assessment be sustained?

Our faculty did not alter the requirement for all learning outcomes to be achieved on courses, nor did it lower the standards required, or inflate the grades with norm referencing. Standards-based assessment remained in place, with extensions available. I know adult learning theory posits learning as not being a race and of learning being lifelong, yet in a 'normal' year such generosity is a rare consideration.

I remain hopeful of a new "normal".

DISCUSSION AND CONCLUSION

We engaged in cogenerative dialoguing on a theme toward a cogenerative outcome (Stith and Roth, 2006). Our collective intention was to invite dialogue to share their experiences of university learning and teaching in the context of Covid-19 lockdowns to inform future, as yet unknown, practices for the better. Our musings constitute collective remembering whereby the diversity and integrity of each author's voice is respected, heard, and held rather than disappearing in the collective voice (Roth and Tobin, 2004). We endorse cogenerative dialogue to engage participants in a conversation about their own actions and provide a forum whereby each participant becomes aware of other participant's experiences (Stith and Roth, 2006).

In writing this piece authors engaged in minimal metaloguing (Roth and Tobin, 2004) to order then make some shared meanings of our musings. Our musings collectively follow a trajectory of design

through to redesign of university educational processes, and present significant learnings and impacts on psychological well-being for us as educators and students of rapidly moving a blended course to exclusively online. Julie and Gema share the merits of reimagining and redesigning learning and assessments processes.

Andrew and Ana appreciate increased flexibility in their learning.

Ana's technological challenges prompt considerations for issues of equity–a reminder that not everyone is privileged with software, hardware and Internet connectivity.

Kelvin's colleagues provide him with support and assistance through difficult times.

Thais shares grief associated with farewelling face-to-face opportunities. She succeeded and learned of her resilience.

Gema, Julie and Sheridan remind us *how* kindness and building rapport are fundamental for learning.

Julie and Kelvin thoughtfully incorporate Covid-19 as a contextually relevant topic.

Ailsa echoes Thrift (2014) by raising and multiplying questions, providing a platform to consider possibilities; to find and explore what is uncharted; to attend to things unstable.

Making use of Thrift's (2008) non-representation theory, we emphasize the affective realm. According to Thrift, affective experiences do not lend themselves to meta-dialoguing so, our musings are not subject to privileging, homogenization or reinterpretation by the authors.

Overall, our musings offer some significant learnings and actions in the Covid-19 context that promoted positive educational and well-being outcomes for learners and teachers. Our experiences support the conclusions of other studies (Zhai and Du, 2020; van Niekerk and van Gent, 2021) concerning the importance of university staff and students strengthening resilience and psychological well-being to mitigate the effects of Covid-19 and other future disruptions.

Cogenerative dialoguing holds a commitment to action and to a hoped-for future (Stith and Roth, 2006). Our musings inspire research and other actions. Julie, Ailsa and Gema explore health students' perceptions of the advantages and disadvantages of studying online. Kelvin, Ailsa and colleagues survey teachers' experiences of online teaching. Kelvin tracks science students' and teachers' well-being during Covid-19 related disruption. Julie and Ailsa consider decolonizing pedagogies. Each project engenders hope for a new "normal".

We cherish possibilities that emerge from Covid-19, as a moment of disruption, for reimagining higher education. Our experiences suggest learning and teaching are enhanced where there is a culture of respect, trust, kindness, collegiality, and thoughtfulness among diverse students and educators for our collective purpose. Our musings, research and other actions add to the growing international dialogue as we (re)consider higher education pedagogy within a new-normal. The musings reflect a shift from our pre-pandemic pedagogy of critical social theory to hopefully creating foundations for a post-pandemic critical digital pedagogy.

While universities continue to develop digital resources and improve their reliability and friendliness, at the same time there is a need to think about broader educational practices, specifically

the *what* and the *how* of integrating digital technologies within higher education (Henderson et al., 2017).

We support the calls for post-pandemic higher education pedagogy, one of hope, that is critical and thoughtfully incorporates digital technologies; one that would consider the educational endeavor as relational and inspiring. We frame post-pandemic pedagogy as a critical social pedagogy of engagement utilizing technologies for what they add; a critical digital pedagogy. We note that higher pass rates occurred than was the norm of previous semesters/years and although the causative effect of this remains uncertain, we suggest the positive impact on student success is associated with a more conscious use of digital technologies with resource development as well as more thoughtful use of the learning management system. Students benefited from the anywhere anytime access of all teaching resources as well as for connectivity with courses less constrained by time and place. For some students their learning needs were better met, and their unique circumstances better adjusted to where learning was less time constrained by due dates for work. This was all in the context of of greater consideration for support and compassion.

We have never previously been required to collectively consider our purpose and how best to get there; the what and the how being front and centered. We remain hopeful that this thoughtfulness for the *what* and *how*, and our working with greater consideration for a relational approach that holds compassion and generosity highly might be sustained within a new "normal" in our learning and teaching endeavors.

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ETHICS STATEMENT

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable data included in this article.

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Looking Back: Reviewing the Challenges of Policy Development During the COVID-19 Pandemic for a TNE Partnership in Higher Education

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This paper takes a retrospective view of the year 2020, with a focus on how Higher Education policy development was undertaken on a Transnational Education (TNE) program between the University of Glasgow (UofG) and the University of Electronics, Science and Technology in Chengdu (UESTC), China in response to the COVID-19 pandemic. It explores the approach to policy development under normal circumstances, contrasting this with the approach taken during the emergence of the epidemic and how the unfolding situation impacted on those policies. It demonstrates how the application of management tools for scenario planning and crisis management can be used effectively to develop a clear and prescriptive policy for staff. It also demonstrates how the use of such tools, combined with careful analysis and planning, can minimize disruption to student learning, teaching, and assessment. The paper then goes on to explain the creation and implementation of policies addressing three main areas: learning and teaching, Final Year Projects, and assessment. Finally, it reflects on the student and staff perspectives on the policies, considering how this information might be used to enhance the policy development process in future.

Keywords: transnational, education, TNE, policy development, pandemic, crisis management, scenario planning, China

INTRODUCTION

The development of operational and strategic policies in the Higher Education (HE) sector is traditionally slow and protracted. In part, this reflects the long "time-constants" associated with all government level decision processes in the creation of policies. A significant factor within this issue is the "processing delay" embedded in educational process constraints, as any new policy must be applied only to new cohorts of students; and hence the outcomes, no matter how desirable their immediate impact, can only become fully evident once students have gone through the full programme (of 3–4 years) until graduation.

The emergence of the COVID-19 epidemic in January 2020 caused major disruption worldwide and affected the HE sector across all its activities, with the greatest impact being on delivery and student assessment. The HE sector is unaccustomed to rapid change and often ill-equipped to

FIGURE 1 | Educational policy development.
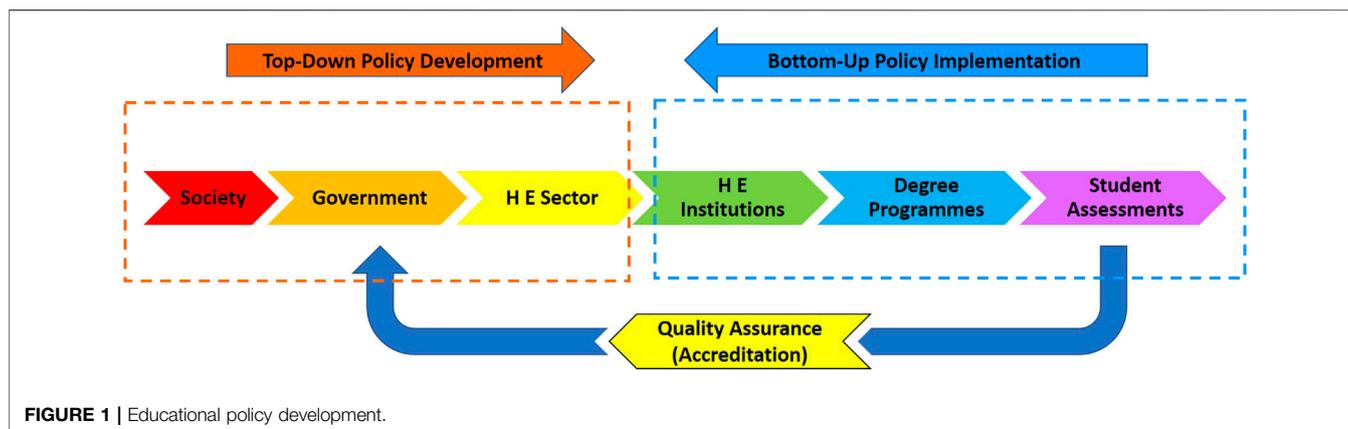
manage such events, which gave rise to an assortment of different approaches at institutional level in an attempt to maintain operations, some of which were more successful than others.

This paper examines how one Transnational Education (TNE) partnership responded to the crisis, through its development and management of new operational policies, based on sound management techniques and tools, to deal with disruption and continue course delivery and assessment of students. The underlying objective of this response was to minimize the disruption to both staff and students through the careful management and communication of any changes and required the rapid development and deployment of several "emergency" policies.

This paper is divided into three main sections; the first part looks at the development, deployment, and implementation of education policy at a national level under normal circumstances, before addressing the specific demands imposed by TNE. Part two introduces Crisis Management as implemented in an industrial setting when dealing with emergency events and then looks at the application of scenario planning tools for developing medium term strategies. The third and final part details the response of a specific TNE partnership and how it used industry crisis management and scenario planning tools to manage the situation. The basis of this paper stems from a conference presentation paper (Bremner et al., 2020) which looked at the preparation of the policy. This extended paper looks at the deployment and implications of the process, reflects on the efficacy of the approach, and summarizes potential insights for future improvements.

The Development of Educational Policy

First, the process of policy development will be explored. A primary objective of all sovereign governments is the leadership of its people through the legislative and political framework according to its constitution. Education Policy, and how a nation state manages the education and training throughout society, has a significant influence on how the nation defines itself both internally to its citizens, and externally to the rest of the world. It could be argued that Education policy, more so than the policies for defense, healthcare, or foreign affairs, encompasses the fundamental

values of a nation. Consequently, education policy creation is a highly complex, consultative, and lengthy process, resulting in a policy comprising of two fundamental parts; the legislative activities, driven by the government that define the strategy, remit, and metrics of the policy; and the implementation details delegated to the education department responsible for meeting the policy objectives (Schmidt, 2008), (Vargas et al., 2019a). **Figure 1** shows a simple flow diagram demonstrating the inter-relationship between these two actors and the paradox in the top-down and bottom-up nature of educational policy. It should be emphasized that while educational policy also covers primary, and secondary education, there is considerably less latitude at school level to determine delivery and implementation modes. In the tertiary sector, universities have considerably more freedom and latitude in how they choose to deliver education.

Within most societies, governmental control of education is exercised through fiscal policy. In the HE sector, this policy operates at two levels (Woodhall, 2007); at an under-graduate recruitment level, by controlling the numbers for domestic student enrolment (Vargas et al., 2019b), and by governmental control through the priorities set for the research funders. The former method is highly effective in influencing institutions dominated by teaching, and the latter particularly effective in influencing the more research active universities (Lang, 2015).

In the United Kingdom, after the passing of the "Scotland Act 1998" (Winetrobe, 2011), which devolved responsibility for education to the separate nations, there was essentially a reduction of power in the United Kingdom central government's ability to directly control education policies uniformly across the regions. This has resulted in different education polices being applied across the United Kingdom (Goddard and Chatterton, 2000) and has made the institutions more aligned and responsive to the cultural and economic needs of the regions in which they are located (Shattock and Horvath, 2020). However, despite the devolved responsibilities the United Kingdom higher education sector still remains highly homogeneous primarily due to the historic influence of central government (Bartelse and Van Vught, 2005).While the effect of this homogeneity has been attributed to a general standardization of the quality of teaching across the sector, this has been at the

FIGURE 2 | Clark's triangle of forces within higher education.
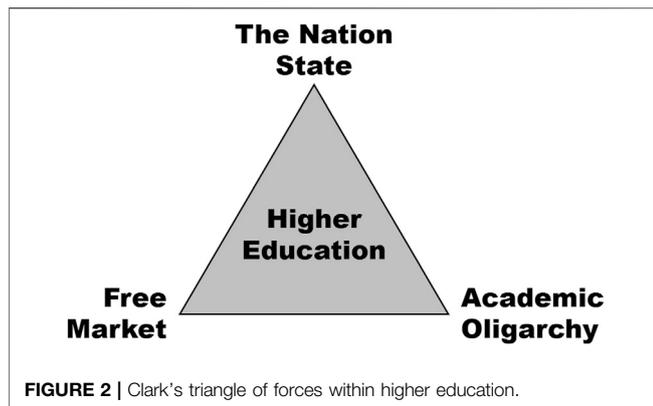
expense of differentiation between institutions as suggested by (Magd and Curry, 2003) and further supported by (Cooke-Davies and Arzymanow, 2003).

However, in contrast to education policy as applied to compulsory school education, HE institutions have considerably greater freedom to define the detailed subject matter and assessment methodology they adopt. This freedom constitutes the "bottom-up" aspect of HE education policy and is fiercely defended by all universities and enshrined in the concept of "academic freedom" (Nelson, 2010). Although a few specific vocational subjects such as medicine, law, dentistry and engineering are governed by professional bodies responsible for the accreditation of course content, format, and learning outcomes, the majority of undergraduate degrees have a large degree of autonomy in curriculum and assessment design.

In virtually all countries, this method of education policy control and implementation has been adopted but given the slow rate of policy change combined with contractual obligations based on funding mechanisms, it works more or less well in differing contexts. However, in the United Kingdom, long recognized for its high-quality education system, the gradual reduction of HE funding has forced HE institutions to seek alternative sources of income.

Transnational Education

As a result of United Kingdom Governmental restrictions on home student recruitment, institutions have been forced to pursue expansion and growth through student recruitment overseas. Initially, overseas students attended the home (United Kingdom) institution but as competition for students increased, this led to the establishment of off-shore operations (Uddin and Papé, 2018), with United Kingdom sending institutions awarding degrees in a host country. The United Kingdom has been particularly active and successful in promoting TNE activities and is currently the global leader in offering TNE (JISC, 2018). This is partly due to changes in the HE funding model (Woodhall, 2007), demonstrating a deliberate repositioning of United Kingdom HE within Clark's triangle (**Figure 2**) (Clark, 1998; 2004), away from the state and academe vertices and towards a market led model (Lang, 2017).

According to the framework proposed by (Knight, 2016), there are a number of different definitions of TNE operations in existence, each with particular characteristics and challenges for the sending and host institutions. Some of these challenges include balancing partnering institutes' mutual expectations, not only in terms of financial outcomes but also in quality of education. At times, there is a challenge of meeting accreditation requirements from both the sending and host country's accreditation bodies, which results in additional workload for staff and students, and this needs careful negotiation and agreement. Further, there are challenges related to differences in working culture and practices of the partner countries, which can create complex communication gaps and may lead to misunderstanding. Finally, the time difference between countries in the partnering organisations can often lead to extended work hours for management, staff and students, which can often overload the people involved. Despite the additional working hours, delays in response to urgent matters e.g., student queries on the night of exam, are unavoidable due to these time zone differences. Therefore, policy development within TNE programs needs to take all such challenges into account. This paper focuses on the specific challenges of a TNE partnership described as a "collaborative TNE partnership" where the United Kingdom sending institution (UofG) operates in a flying faculty model (FIFO) and the host institution (UESTC) has facilities (Glasgow College-UESTC) dedicated to the students and the partnership (Sidhu and Christie, 2015). Teaching delivery is shared equally between the partners on a subject basis and graduating students from the College receive a degree certificate from each partner. By necessity, this structure demands close and complex interactions across the curriculum and between the partners, demanding highly integrated support and cooperation in both teaching and administration (de Souza-Daw et al., 2019).

In the collaborative model, these pressures are felt acutely by the FIFO teaching faculty, and considerable effort must be expended by the sending institution in the preparation and training of staff (Mizzi, 2017). Regrettably, too little emphasis is attributed to the challenges faced by staff who must assimilate new cultural awareness skills, often with associated new classroom skills, to reflect the different cultural traditions of their new student cohorts (Hénard et al., 2012), and who must develop pragmatic coping strategies (Tharapos and O'Connell, 2019). This cultural transition can be particularly challenging in the FIFO model as staff must switch between two different cultural and teaching regimes frequently (Mizzi, 2017).

The ability to create a successful partnership structure (Li, 2019) demands close and intimate alignment of processes and procedures, with a mutual understanding of the respective cultures and policies between the partners if the end result delivered to students is to appear seamless. The demand and commitment by the partnership in support of the TNE activity must be commensurate with the returns and rewards if it is to survive and grow (Bennell, 2019).

In contrast to the development of a national educational policy, prepared using a top-down approach (Hénard et al., 2012), delivering education and the associated work practices necessitates a bottom-up approach. The establishment and growth of Communities of Practice (CoP) (Tharapos and

O'Connell, 2020) often leads to the development of informal standard practices and procedures. In normal circumstances, these internal policy artefacts are written and improved over an extended period; a luxury that eluded staff from both institutions in response to the COVID-19 epidemic. This paper examines how a pragmatic approach to the development of operational policy was used to educate and assess TNE students undergoing on-line teaching, while ensuring that high standards and learning outcomes were maintained.

The Theory and Practice of Crisis Management and Scenario Planning

Studies in Crisis Management and Scenario Planning have been discussed at length in management literature (Helsloot et al., 2012) and the terms are frequently conflated as though synonymous. However, this is not the case. In the present era of "Black Swans and Mega Crises" (Ansell and Boin, 2019), unplanned events seem to occur more frequently and it is more important than ever to be clear on the meanings of the two terms and how they would be applied to exceptional or unplanned events.

"*Crises will always happen and cause surprise*" (Jasanoff, 1993; Clarke, 1999; Perrow, 2011); it is the skill, experience, and leadership of those involved in the management of that crisis which will dictate how successful an organisation is in navigating its way through the challenge to reach a distant "refuge point". In the context of this paper, we will use Boin, Kuiper, and Overdijk's definition of crisis management "*as the sum of activities aimed at minimizing the impact of a crisis*" (Boin et al., 2013). Effective crisis management saves lives, protects infrastructure, and restores trust; and can be summarised in the following three activities:

- Making things happen: crisis management is about organizing, directing, and implementing actions that minimize the impact of a threat;
- Getting the job done: forging cooperation between previously unrelated agents; and enabling "work arounds" when routines and resources do not work;
- Fulfilling a symbolic need for direction and guidance.

In short, crisis management provides leadership to those involved and overwhelmed by the crisis through a route to "salvation" and eventual normality. Traditionally, crisis management is usually a short-term activity and made popular by many Hollywood "disaster movies", where the hero rides to the rescue and saves the day. However, in a real-life crisis the situation is more complex and has two orthogonal dimensions; operational and strategic (Ansell and Boin, 2019). On the operational dimension, we find first responders, control room operators, and system experts. They are the professionals trained to deal with glitches, accidents, and emergencies and are often the hero portrayed in the Hollywood movie; they exemplify the first two "action oriented" activities listed above. On the strategic dimension, we find the senior managers or political leaders who carry ultimate responsibility for the outcome of the crisis. The

task of this group is to support the operation team by removing (organisational) obstacles and providing sufficient freedom in which to allow the operational team to perform their duties. However, the more significant role of the strategic group is to consider the route to recovery after the initial crisis has passed. This is achieved through the formulation, communication, and implementation of a recovery plan or policy.

The reference to "strategic" activities in crisis management may be the reason for the confusion between crisis management, scenario planning, and strategic planning, but they are radically different in approach and fundamentally different in purpose. Whereas crisis management occurs *in response* to an unplanned event, scenario planning is concerned with *how* an organisation might respond *if* a given event occurs (Godet, 2000; Aljuhmani and Emeagwali, 2017). Strategic planning is the development of a forward-looking plan that identifies future opportunities and aligns them with the capabilities within the organisation to capitalise on those opportunities. During the development of a formal strategic plan, scenario planning is one of a suite of tools that may be employed to quantify and qualify the most appropriate strategy for an organisation.

The benefits of integrating scenario planning into crisis management has been recognised in the past by Preble, 1997, but as a defensive rather than offensive strategy. The greatest challenge in applying scenario planning tools in crisis management is the quality of data upon which decisions must be based. A key aspect of any crisis is the novelty and fluidity of the situation; the application of predefined processes reliant upon good information is not possible and a pragmatic approach (Weber, 1987), sometimes referred to as "Practical Rationality" (Garrison, 1999), must be used. The fundamental challenge in developing scenarios is the ability to differentiate between facts, opinion, and intelligence. Ex US Secretary of State for Defence captured this succinctly during a recent television interview by responding: "*If it were a fact it would not be called intelligence*" (Rumsfeld, 2016). This statement epitomises the problem in a crisis; the team must make decisions based on "intelligence" not on "facts", and this requires considerable intellect, combined with a pragmatic mindset, to make rational sense of the situation.

A particular tool used in the evaluation of data in this instance is the Johari Window (Luft and Ingham, 1961) and shown in **Figure 3**. This tool was originally developed for analysing self-awareness in individuals, but it can equally be applied to an organizational situation to evaluate a crisis or scenario. An adaption of this tool was also used by the US Defence department and summarised in Donald Rumsfeld's infamous news briefing of February 2002 "*There are Known-Knowns . . . ; there are Known-Unknowns . . . , and there are Unknown-Unknowns*". This is not a new concept as it aligns well with the teaching of the Chinese philosopher and military strategist Sun Tzu:

"If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle (Clavell, 1983).

Like any other real-world avenue, the opportunities in HE and especially TNE come with risks attached. The crisis events such as

FIGURE 3 | Johari Window of self-awareness.
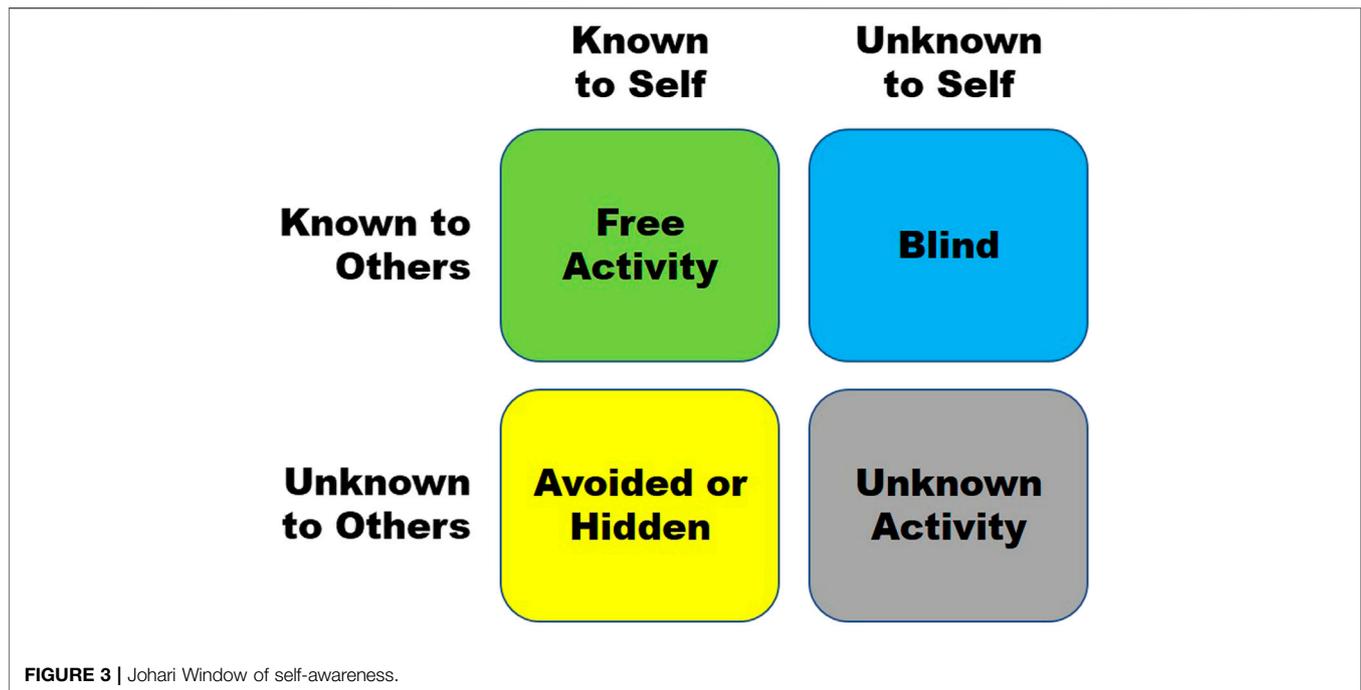
the bonfire tragedy at Texas A&M University, USA in 1999 and campus shootings at Virginia Tech, USA in 2007 have highlighted the need for crisis management policies and planning in higher education (Wang and Hutchins, 2010). TNE is now increasingly seen through a business lens, and one frequently comes across terms such as "export", "industry", and "market" in this context. Although there is plenty of research on the financial implications and risks of running a TNE program (Wilkins and Huisman, 2012; Tayar and Jack, 2013), studies on the risks involved in the delivery of education in such programs are non-existent. Therefore, with the background experience and knowledge of the management team, it was felt appropriate to apply scenario planning and crisis management to manage the unforeseen circumstances and rapidly worsening situation with the aim of ensuring successful continuation of student learning activities.

The approach taken illustrates how a combination of traditionally disparate tools can be combined to address the crisis caused by COVID-19 in a TNE context. Scenario planning and crisis management are well tested and have been relied upon for many years in commercial enterprises (Chermack, 2004) as aids to long term planning and crisis control. However, it is rare to see these applied in the HE sector to assist in the development of policy (Rieley, 1997; Hašková and Verešová, 2013).

BACKGROUND AND CONTEXT

The collaborative partnership between UESTC, a Chinese "Double First" University (Liu et al., 2019) and the University of Glasgow, a United Kingdom Russell Group University has been in place since 2013, through a dedicated "faculty" in UESTC known as the Glasgow College with an undergraduate population of ~2000 students. The partnership was created to develop greater collaboration and increase both institutions' visibility globally. The benefits and ethos of establishing TNE partnerships have been discussed frequently in the literature (Hénard et al., 2012; Carter and Rosen, 2019; Li, 2019; Lu, 2019; Tang and Tang, 2019).

The dual degree program (Knight, 2016) offers students a combination of the best of Chinese education pedagogy with that of the United Kingdom (Henard and Roseveare, 2000; Bryde and Leighton, 2009). The 4 years BEng degree program, in which English is the sole medium of instruction, aligns closely with the standard non-TNE degree programs in the respective partner institutions, thus allowing a common curriculum to be met by both institutions.

The period covered by this paper is from the January 9, 2020 when the earliest signs of the virus appeared (Evans, 2020), until the end of November 2020, approximately two-thirds through the first semester of Academic Year (AY) 2020/21. It was evident by the 15th January ((AIG), 2020) that the situation was deteriorating rapidly across the whole of China. Public concern began to rise globally and on the 22nd of January the United Kingdom Foreign and Commonwealth Office (FCO) issued advice to avoid travel to the Wuhan area; at the same time the World Health Organization (WHO) issued a Global Health Warning of a serious virus outbreak (World Health Organization, 2020).

CRISIS/CONTINGENCY PLANNING FRAMEWORK

During the ongoing monitoring of the situation, it became apparent that a more formal approach had to be adopted by

FIGURE 4 | Shark diagram of Crisis Management.
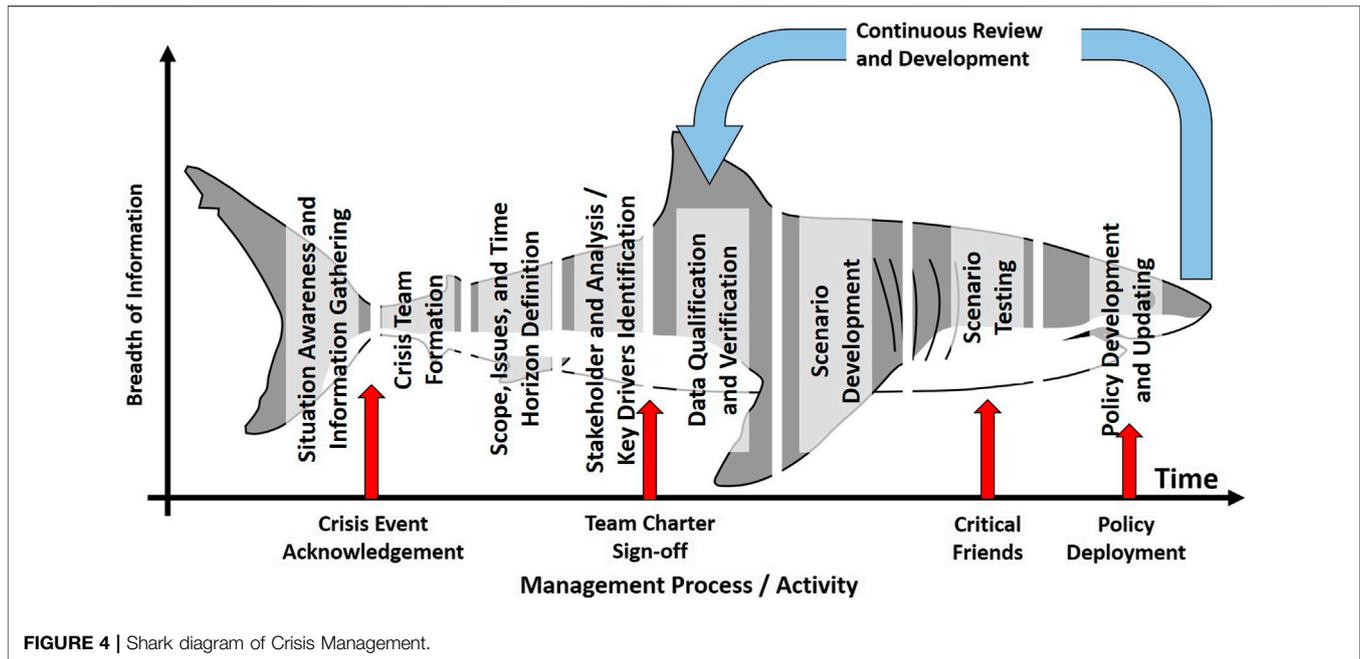
TNE management in Glasgow to manage the unfolding crisis. Crisis management techniques (Smits Stanley and Ezzat Ally, 2003) are well known in industry to deal with disruptions; it was thought that, if combined with scenario planning methods (Preble, 1997), they would provide a suite of tools capable of analyzing the evolving situation to inform the creation of a policy for FIFO staff. The approach adopted can be best summarized as a combination of classic crisis management techniques (Hickman and Crandall, 1997) with the environmental scanning methods regularly adopted by scenario and strategic planning. This is best visualized in a new proposed operational model, referred to as a "shark" diagram (**Figure 4**) which reflects the breadth and complexity of information management in a crisis. The diagram captures the 8-stage process from initial detection through the gestation of the problem, until an effective and practical policy can be created and communicated.

In this section, each stage of the above mentioned 8-stage process is discussed within subsequent sub-sections. *Situation Awareness and Information Gathering* addresses discussion on "Situation Awareness and Information Gathering" followed by understanding the process of "Crisis Team Formation" under *Crisis Team Formation*. At the heart of such management lies detailing the "Scope, Issue, and Time Horizon Definition" that is shared in *Scope, Issue, and Time Horizon Definition*, leading into *Stakeholder Identification and Analysis/Key Driver Identification*, which addresses "Stakeholder Identification and Analysis/Key Driver Identification". Moving towards the implementation domain, "Data Quantification and Verification", "Scenario Development", and "Scenario Testing" are, demonstrated in *Data Quantification and Verification, Scenario Development, and Scenario Testing*. Finally, "Policy Development and Updating" finishes the continuum of our living process in *Policy Development and Updating*.

Situation Awareness and Information Gathering

The first stage in crisis management usually occurs before a tangible crisis has been identified. During this phase, relatively sparse, duplicated, and often conflicting information (Pan et al., 2012) begins to appear across a variety of communication channels; the greatest challenge is in managing the flow of this information and determining its reliability and accuracy. An effective tool in managing such information is a modified Jochari Window matrix (Esposito et al., 1978) which is used to identify and classify known and unknown information from multiple sources. The technique provides a framework within which to cluster and classify information and is useful in articulating and prioritizing "I wish we had … " statements. The matrix cannot supply the information but helps direct an intensive investigation to uncover the required data.

Establishing the accuracy (veracity) of each independent source is a significant problem during the early stages of any crisis and is well-researched in operational management (Lozano et al., 2020), where the need for decisions to be made, based on incomplete information, is commonplace (Weber, 1987). The outcome of the first phase is an articulation of the crisis, with a qualitative summary for senior management on how the crisis might impact students; at this stage is not possible to quantify the severity of the problem. However, this situation report, similar to a high-level market horizon scan in a business context (Abu Amuna et al., 2017), should answer the question: "Should a crisis team be formed?"

Crisis Team Formation

Crisis management is a specialist area usually associated with emergency response teams or first responders within a

manufacturing context, or reputational damage in a marketing or publicity context (Coombs, 2007). While reputational damage crises are relatively common in the HE sector, their impact is usually contained. However, in the case of COVID-19, a much larger crisis was evolving, impacting all facets of learning, teaching, and assessment of the students engaged on the program.

Crisis management requires two orthogonal activities; one operational and the other strategic. The "front line" crisis management team predominantly consists of operational managers assisted by subject experts or specialists as required, whereas the strategic team requires longer term managers and leaders. The organisational structure should be flat, with direct communication links between members designed in a star configuration (Pan et al., 2012) to minimize delay, filtering, or lag. Team size should be limited, as the communication load increases exponentially as membership increases. The team leader in a crisis management team must have delegated authority and executive power to implement proposals. In the specific situation described, this role was undertaken by the Vice-Dean at The University of Glasgow, as the Chinese partner university (UESTC) had closed for spring break and all staff were in lockdown. The initial briefing of the crisis management team focused on sharing the situation awareness information, ensuring a shared knowledge starting point.

Scope, Issue, and Time Horizon Definition

With any project team formation, the first step is the definition of a charter covering the scope and issues to be addressed, and timescales for both implementation and intervention. The underlying objective in crisis management is the mitigation of the negative impacts resulting from the crisis but does not extend to identifying a permanent solution; this would be the focus of a follow-on team and is often part of the brief for the strategic team members. The charter agreed for the crisis management team comprising teaching FIFO staff can be summarized in the following eight principles:

- Minimization of any impact to student learning and experience should be paramount
- Technological limitations on home-based students should be recognized
- The status quo (normal operation) should be modified as little as possible on the assumption that "normality" would return eventually (potentially before the end of the semester)
- Any plan should be based on a worst-case scenario but there should be contingency for the event that the situation improved (plan for the worst, hope for the best)
- Wherever possible, the impact of problems should be limited to a single semester to minimize effect on the new academic year (2020–21)
- The most time critical/learning critical issues should be identified and addressed first (therefore, graduating students (Year 4) should be prioritized over year 1)
- A "best fit" approach for the majority of students should be adopted; outliers should be addressed on an individual basis

- Assessment solutions should be robust, irrespective of mode of delivery.

Scope and issues identified in this section provided the direction for the development and implementation of the learning and teaching policy discussed in *Policies and Implementation for Learning and Teaching*. The timescale for developing and putting the plan into operation was the start date of the 2nd semester; 24th March. The intervention would be sustained throughout the semester until the end of June 2020.

Stakeholder Identification and Analysis/Key Driver Identification

When addressing any crisis, it is very easy for the crisis management team to become myopic, focusing only on immediate issues without considering the wider implications of any actions. A method of reducing the likelihood of this risk is to perform a formal stakeholder analysis (Pan et al., 2012). Performing this analysis in the early stages of crisis management enables a robust communication plan to be developed. Through the analysis, the team identified the stakeholders, their relative importance and how best to communicate with them. While the most obvious stakeholders during the crisis were the students and staff, the parents of the students and the two institutions themselves were also of significant importance.

Data Quantification and Verification

After deciding to form a crisis management team, the information supporting the decision is highly qualitative. The 5th stage in the crisis management process draws directly from strategic planning and concentrates on quantifying the data (and sources) and defining reliable metrics. It is imperative that clear targets are defined for the identified metrics, some of which may be in opposition, along with a weighting algorithm to be applied in the quantification process. There are many options available on how this may be best determined (Mendelow, 1981), however, it should be based on building consensus within the team. Simple voting protocols are not recommended as they are divisive and reduce team effectiveness.

Scenario Development

Scenario development principles have been used for many years in strategic planning and are equally applicable to disruptive events. The underlying principles require that the crisis team develop a small number of scenarios they believe to be equally plausible, but not necessarily equally probable. The probability is irrelevant as the underlying premise can be summarized as "*What if . . . *". Each scenario must be developed to a level of detail where everyone can appreciate and understand the significance of its starting point. The scenarios ranged from students being absent for only three to 4 weeks at the beginning of the second semester to not returning at all until the following academic year in September; this latter scenario proved to be the case.

Scenario Testing

Once identified, each scenario must be analyzed and tested to estimate its impact. Whereas at the scenario development stage the initial conditions and important variables for each scenario are defined, during this phase the team attempts to predict the impact of each scenario as it would play out over time. The team will refer to the metrics and weighting algorithm from Phase five to evaluate the overall impact on the key stakeholders. There is no consideration of probability when analyzing each scenario; the assumption is that the scenario has happened and must be managed. During this phase, there is an opportunity for any assumption to be challenged to test the resilience of the scenario. the outcome should produce a clearly articulated set of three to four scenarios with an estimated impact for each.

Policy Development and Updating

The last phase of the process is to compare the predicted findings from each scenario with the most recent situation report. The team may then decide to discard or modify the weightings attributed to one or more of the scenarios, or to include a previously less likely scenario. Using the information from valid scenarios, a policy document is prepared for staff and students. This may be a suite of separate documents but must be self-consistent to avoid potential conflict. When preparing policy or policy modifications for use in a crisis, there must be clarity of intent and unambiguity in implementation resulting in a highly prescriptive "tone". The new policy must be approved by the relevant stakeholders and communicated effectively to its intended audience. In the COVID-19 example, the team leader held a briefing session with all affected staff. Home-working student counsellors based in China contacted every student and their parents to explain the significance and purpose of the revised policy.

After completion of the revised policy, the crisis management team remain in place to continually monitor the situation for any change that could result in further policy modification. It is also good practice for the team to check the revised policy for efficacy or unintended consequences.

POLICIES AND IMPLEMENTATION FOR LEARNING AND TEACHING

The most immediate challenge for the spring semester of AY 2019/20 was the move to online teaching and learning delivery and assessment, including laboratory activities designed for conventional face-to-face delivery. Nineteen courses were affected, most of which were in technical subjects. In addition, all Year one students took a 40-credit English for Academic Purposes (EAP) course, as part of their ongoing language development within the programs. Student cohort sizes ranged from over 500 in Year one to just under 300 in Year 4, with a total student population of approximately 1,700 students. Of the 19 technical courses, ten were delivered by staff from the partner institution in China in synchronous mode, while the remaining nine courses were delivered asynchronously by UofG staff. Fortunately, all Year four taught modules had already been

delivered and assessed in the first semester so students in this final stage of their degree were only working on their Final Year Projects (FYPs). This mitigated the impact on final year students arising from changes required to the learning and teaching delivery and is further discussed in *Final Year Project Policy and Implementation*.

The choice between synchronous or asynchronous delivery was a topic of considerable debate within the management team at the UofG; while synchronous delivery would potentially enable greater contact between students and lecturers in a live lecture hall setting, much of the desired interactivity and immediacy would be lost. Furthermore, there was significant concern regarding the reliability of the network connection between the United Kingdom and China to facilitate online live course delivery for up to 500 students, each accessing the connection from their individual homes across China. Additionally, the 8 h time difference between the United Kingdom and China only permitted a small time overlap for delivery giving rise to scheduling difficulties. Inevitably, these timetabling constraints demanded that either staff or students were involved in "end-of-day" teaching, unlikely to be conducive to a good learning or teaching experience. For these reasons asynchronous delivery was chosen as the most reliable and flexible approach by offering pre-recorded lecture material uploaded to the Virtual Learning Environment (VLE) in this case "Moodle", with follow up live (synchronous) sessions to provide for student-instructor and student-student interaction. This event was be delivered twice to ensure all students had the opportunity to participate, even where technical problems might exist.

Semester 2 Policy for Learning and Teaching

Based on the above decisions, the Learning and Teaching Policy for spring (semester 2) was communicated to UofG staff. Lecturers were asked to deliver lectures by creating and uploading PowerPoint presentations with voiceover, with a recommendation that each lecture would be limited four to five short presentations of approximately 10–15 min including lecturer live or recorded input and audio/video clips. This recommended size and length was based on network channel capacity issues, and pedagogical factors relating to the likely maximum attention span of students. Staff were also requested to prepare additional slides/material in advance to replace real time worked examples normally delivered in a live face-to-face lecture setting.

It was decided to run the follow up live interactive sessions as 90 min (two academic hours) tutorial sessions in the week following lecture delivery. The intent was to allow students to reflect on the taught material so they might raise questions with teaching staff in a real-time. To facilitate this, the platform Zoom, in webinar mode, was used for the sessions, with a recording then uploaded to the VLE to allow student revision and to accommodate any students unable to access the live sessions. The scheduling of these live tutorials was set for evenings (Beijing time) to mitigate issues around the time difference between the United Kingdom and China. In addition to the main Moodle

VLE, teaching materials were also shared through an additional VLE (Blackboard) which was used for UESTC courses and considered potentially more accessible than Moodle, with the support of administrative colleagues at UESTC. The Chinese "QQ" instant messaging software service was also used by UESTC student counsellors to provide all announcements and updates to students.

In courses involving student group work, provision was made to deal with specific learning and teaching requirements however this is outside the scope of this paper but as an exemplar, the interaction required on the Year three Team Design Project was facilitated through the use of Zoom, while individual group meetings used Chinese online services such as "WeChat" or QQ.

Implementation of Semester 2 Learning and Teaching Policy

As a policy requirement, UK-based staff teaching on technical courses delivered their courses asynchronously, using pre-recorded lectures and on-line laboratories. Due to time constraints, teaching staff based their material on existing lectures used in previous years in a face-to-face setting, adapting this for online delivery where possible. Modifications to the format and content were carried out to meet the needs of the new delivery mode. This required content to be divided into smaller "chunks" of learning and the inclusion of video clips and short tasks to encourage student participation and engagement. The result was the rapid transition towards a blended delivery model.

For courses involving laboratories, it was not possible to deliver the lab component in the conventional face-to-face format. Staff, therefore, considered the learning objectives of the sessions and converted these into one of two formats. Design centric laboratories were converted from hardware to simulation style tasks and students were asked to submit their completed work through Moodle. In the case of experimental-based labs, lecturers generated a set of experimental results, which allowed for student analysis and completion of coursework. Both approaches aimed to ensure the same level of cognitive development as face-to-face delivery had provided.

Much of the English course was delivered synchronously (using the Zoom platform) to much smaller groups of 20 students by teachers based in China. This was the normal group size prior to the pandemic as it was recognized that there was a need to maintain this to allow for useful language practice and task-based language teaching and learning to be delivered. When working with these small groups, technological issues were significantly reduced, enabling effective remote face-to-face sessions to be delivered. The facilities that Zoom offered, such as breakout rooms, where students could interact with each other, allowed for group work and face to face speaking practice to continue.

This overall strategy for semester 2 (AY 2019/20) was designed and then implemented to ensure that all students would be able to access learning, irrespective of internet connection reliability, and be able to study at their own pace. All course modules were delivered in accordance with the existing program and module specifications, with minor necessary adjustments while maintaining the Intended Learning Outcomes (ILOs) of each course. Where adjustments were deemed necessary, there was consultation and subsequent agreement reached on these changes with the appropriate external examiners. The VLE became the main repository and vehicle for delivery and the additional materials to illustrate worked examples were also an important course feature. Some courses used web-based tools such as Piazza, allowing students to ask questions and provide feedback anonymously. Although this policy and its implementation was viewed as the best potential approach to provide a rapid, workable solution to the crisis, it was recognized that it would not, and could not, deliver courses which could integrate sustained interaction nor fulfil student expectations in terms of offering a satisfactory mechanism for engaging in their studies. This recognition facilitated the development of a new Learning and Teaching Policy for the following academic year.

Semester 1 (AY 2020–21) Policy for Learning and Teaching

The formation of the new policy was based on staff and student feedback from the spring semester, as detailed in *Conclusion* of this paper, and pandemic-related developments in both countries. In China, as the situation improved to the extent that student returned to campus in August 2020 to undertake final missed exams. For UESTC delivered courses, this meant a return to campus-based face-to-face teaching and learning however, continued lockdown in the United Kingdom combined with travel restrictions led to the decision that no travel to China for teaching duties could be sanctioned throughout the first semester of the new academic year (AY 2020–21).

For United Kingdom based staff it was therefore decided that online delivery would be continued, however it would be modified to become live delivery (real time) through Zoom. The organization was no longer in reactive mode and could incorporate lessons learned in the previous semester, combined with new systems developed to optimize learning and engagement remotely. To avoid over-dependance on network connectivity, the lectures were delivered to a single connection to a lecture theatre in China. At UESTC, the lecture was facilitated by a Graduate Teaching Assistant (GTA). Students would attend the lecture as they would a live face-to-face lecture i.e., in the lecture theatre and viewing the lecture as a group on a single screen, rather than accessing the lecture individually.

As a part of this policy, in addition to students being physically present in the lecture theatres, the lecturing schedule for each remotely delivered course was amended from the normal fly in model, where lectures were delivered in a block of 1 week in four, to weekly delivery. It was hoped this would give students a better learning experience. UofG lecturers were also asked to adopt a hybrid approach to content delivery, preparing short video clips of no more than 15 min' duration, which could be interwoven into the live streamed lecture to provide a variety of modalities throughout the session. The use of video clips also mitigated issues that might arise due to network interruptions or

unreliability, as if any such problems took place the videos could be played locally by the GTA.

During lectures, several activities were integrated with the aim of enhancing student engagement and participation. After each video clip was played, some type of short interactive task took place. This included the use of oral Q and A (live-over-internet), working on design and/or numerical exercises, quizzes, audience polls and "think, pair, and share" activities. The GTAs were briefed on these tasks by the lecturer in advance to ensure they were able to facilitate this kind of interactivity. To further increase student engagement during lectures, staff were also requested to use the Moodle Chat function, which enabled students to have text-based, synchronous discussions. Outside of scheduled lecture time, forums on the VLE were used which enabled students and lecturers to have asynchronous discussions over an extended period, and thus further support teaching and learning. Staff uploaded all materials, including recordings of each lecture, to the VLE post-live session to increase accessibility for students and to mitigate issues arising from connectivity problems during the lecture. All videos included transcripts and/or captioning were prepared in accordance with the University of Glasgow Accessible and Inclusive Learning Policy (University of Glasgow, 2020c). Labs were conducted as normal (i.e., face-to-face), but as lecturers could not be physically present in the lab, additional academic support was provided by local UESTC staff.

Early student feedback on Semester 1, AY 2020–21 delivery, through student-staff liaison meetings and other more informal discussions with students, indicates that the delivery mechanisms adopted have been met with greater enthusiasm from students and could therefore be considered more successful than the "emergency" delivery system used previously. A key factor in this policy implementation has been the use of GTAs to support course delivery. A downside of the revised policy has been the significant additional workload entailed in preparing for and delivering this enhanced learning and teaching model.

FINAL YEAR PROJECT POLICY AND IMPLEMENTATION

The Final Year Project (FYP), sometimes called a "Capstone" project, is an integral component of most undergraduate engineering degree programs. As a Scottish University, whose degrees run over four years, the FYP in Year four runs across a full academic year (2 semesters) and requires the student to demonstrate competence across a wide range of ILOs. To complete the FYP, students must become familiar in activities ranging from software development and simulation to hardware-based experiments. While it might be thought that software development and simulations would not require physical assistance or presence on campus, an issue had been identified that many students may not have access to suitable computing devices and/or software. In addition, as part of course assessment for all FYPs, students must deliver an oral presentation on the final outcome of their project to an assessment panel; with the onset of the pandemic, it was necessary to establish alternative plans to cover all types of projects.

At the early onset of the pandemic, we quickly realised the urgency to re-formulate FYPs. While becoming more aware of the situation on the run and keeping a continuous eye on it with assistance from relevant university departments in both countries, on both ends, we gathered valuable information on of the type of impact to expect for FYP delivery. Based on this, an FYP crisis team was formed, consisting of executive members in both organisations. In the first instance, the scope of issues was forecast along with possible timelines. Primary onus was identified as on the supervisors to make sure the original planned FYPs were able to continue and to identify any required modifications to allow for successful proceedings in absentia of physical facilities. Data was collated across the program, developing understanding of various possible scenarios, leading to specific policy development.

Hence, during the emergency semester (spring) of AY 2019–20 there was a need to develop a remote supervision model for FYPs. This required the review of all projects and where necessary, revision and adaptation of those that were mostly hardware based such that the ILOs could still to be met, while ensuring each project (which had been initiated in the preceding fall semester) could reach a satisfactory conclusion. This led to most of the hardware-based projects being converted into software-based/simulation-based outcomes. At the commencement of AY 2020–21, when students would be back on campus at UESTC, it was anticipated that students might opt to work on hardware-based projects. This created greater challenges for UofG lecturers, unable to travel, and, therefore, not able to meet with the students in person.

There were two main areas where FYP supervision policies were modified: 1) appropriate guidelines and recommendations for supporting students within the remote supervision model were introduced and 2) Greater emphasis was placed on risk assessment and mitigation due to the challenging environmental conditions.

FYP Policy

A policy was developed accounted for the disruptive circumstances and covered the aspects mentioned above. The salient points of this FYP contingency policy document were:

- The supervisor is required to ensure their proposed projects are low risk with respect to its type (i.e., software-based or hardware-based).
- If a project is software-based, the necessary software must be accessible and freely available to the students for use on their personal electronic devices. Where this is not possible for AY 2020–21, the software must be made available on FYP laboratory machines.
- If a project is hardware-based, these should be avoided. However, if students are allowed on campus and, therefore, able to work on FYPs in this setting, this may be permitted. A clear statement of how the supervisor plans to fully support and provide material for the student must be in place.
- Appropriate, effective, and satisfactory actions must be devised by supervisors to mitigate any impact on student

performance caused by the adverse conditions. This mitigation plan must be communicated to students at the beginning of the project to ensure transparency of assessment parameters.

- The FYP coordinator should be informed of any issues which arise over the duration of the project. Concerns and proposed mitigation solutions for all moderate and high-risk projects should also be discussed with the coordinator.
- The Teaching Offices (TO) at both institutions are jointly responsible for ensuring all FYP documentation is kept updated and students informed of any changes initiated in a timely manner.
- In the event of any further pandemic outbreaks or "waves", a 2 week extension will be granted to all students for the submission of the final report even though submission and marking is already done remotely through the VLE.
- As United Kingdom academic staff are unlikely to be able to travel in semester 2 (spring AY 2020–21), oral presentations and demonstrations may be set up and delivered remotely via an appropriate web conferencing application such as Zoom.

FYP Policy Implementation

Based on the above FYP policy for project supervision and assessment, all academic staff involved in supervision are requested to design, review, and propose suitable projects, applicable for successful supervision even under a pandemic scenario. Supervisors still managed to propose projects of a consistently high standard, retaining innovative and creative qualities desired in FYPs. After project allocation, students and supervisors were informed of their respective counterparts at least 5 weeks prior to the beginning of semester 1. They were encouraged to make early contact with each other to establish a good understanding of the project requirements and to clarify how the remote working model would work in practice.

It was highly recommended that supervisors maintain, at the least, a biweekly e-meeting with their supervisees. Such meeting could be conducted using whichever communication channel was mutually suitable to the supervisor and their supervisees, including, but not limited to, Microsoft Teams, Zoom, and/or Skype. A number of supervisors had already found the use of WeChat extremely useful for contacting supervisees for informal discussions beyond their scheduled e-meetings. The students were required and regularly reminded to keep a detailed log of these meetings, including information covering date and time, communication mode, and discussion points. This logbook was then uploaded as an Appendix as part of their assessment submission.

The FYP final project reports were (AY 2019–20) and will (AY 2020–21) be submitted electronically via the VLE, while Microsoft Forms has worked well as a tool for the collection and collation of marker grades and feedback. Final oral presentations were (AY 2019–20) and will (AY 2020–21) be conducted live online via Zoom, with presentation grades being collected via Microsoft Forms. Based on (AU 2019–20) experience, additional guidance and technical support has been put in place to resolve or mitigate any unforeseen issues.

In the last assessment cycle (May 2020), nearly 300 FYP oral presentations were conducted in fifteen parallel sessions over a period of 3 days. In each presentation session, the student presented their work in front of their two assessors via Zoom. All online presentation assessments were conducted smoothly. As minor technological glitches were experienced during the AY 2019–2020 presentation phase, additional guidance and support has been put in place to resolve or mitigate any issues.

In May 2021, it is expected nearly 425 oral presentations will take place. To meet this larger assessment challenge, an approach is being designed that takes account of lessons learned from previous years by increasing the number of parallel sessions.

ASSESSMENT POLICY AND IMPLEMENTATION

In any education system, assessment plays a pivotal role in driving student learning and impacts upon the relationship they have with the curriculum. The assessment at individual course level has a direct correlation with the content and input the lecturer delivers. At the institutional level, assessment policies and practices must demonstrate fairness, equity, and reliability to all external stakeholders. These policies are also influenced by external stakeholders such as professional accreditation bodies (Anwar and Richards, 2018). At the UofG, the assessment policy is set at the institutional level through its own regulatory code, Glasgow University Assessment Policy (University of Glasgow, 2020a).

There are two main types of assessments employed by the joint program at Glasgow College, UESTC. Continuous assessment (CA) covers assessment that is undertaken and submitted during delivery of the course and on most technical courses, provides up to 25% of the overall assessment weighting, whereas in the English language courses, 70% of the overall assessment is covered using CA during semester time activity. The final written exam or End-of-Term Assessment (EoTA), which takes place in an invigilated environment during the "exam diet", constitutes the balance of the course assessment (75% in the case of most technical courses).

Within technical courses, CA might include reports on laboratory-based experiments, project work assignments, in-class quizzes, or set exercises. Most CA is normally submitted as an assignment uploaded to the VLE (Moodle). During the pandemic, activities requiring the completion of CA e.g., for the lab report, required review to ensure that the assessment was still valid and fair. During semester 2 (AY 2019–20), experimental tasks and activities involving the physical use of electronic hardware had to be redesigned so that software and simulation-based alternatives could be adopted. GTAs, who would normally assist in conducting the experiments, had to be retrained to implement the redesigned CA activities in an online environment.

The EoTAs presented an even greater challenge, due to the need for a secure, invigilated environment in which to conduct an exam. By the end of the spring semester in May 2020, COVID 19 was under relative control in China but students were still not

permitted access to the campus. In response to the pandemic, UofG assessment policy, as in all other United Kingdom HE institutions, had been amended to take account of the complex circumstances surrounding assessment and to ensure that students were not treated unfairly. A new No Detriment Policy (NDP) was put in place, which included the requirement to make all final assessment available online.

As the students were de facto University of Glasgow students they were subject to this new policy. However, due to the structure of the TNE partnership demanding that the views of both partner organizations be considered, it was not possible to carry out EoTA online. Although TNE staff in both institutions had prepared and run an online assessment as a pilot test, UESTC staff were reluctant to implement this. In part, this was a result of a recent, poorly executed online exam that had caused problems at UESTC, but in addition, there was concern related to exam security and fairness, combined with the belief that students would return to campus in time for the end of semester 2 exam diet. This demonstrates a real-world challenge in decision making for TNE programs, where the requirements of different educational systems and cultures may cause difficulties. In the end, the students were not able to return to campus and all semester 2 EoTAs were postponed until August when the students returned to campus for AY 2020–21. The exams were scheduled immediately prior to the commencement of the new academic year.

The No Detriment Policy

Early in the pandemic, UofG introduced a detailed assessment policy to ensure a timely progression or completion of courses, in which students' grades would not be adversely affected by the situation (University of Glasgow, 2020b). As Glasgow students, the TNE students were permitted to benefit from the policy in two specific areas:

- Any student could resit an examination with no penalty (i.e. they could try and improve their grade and were awarded the best grade from the two attempts)
- Any year 1 or year 2 student received an automatic progression to the following year irrespective of exam performance (these years do not contribute to overall GPA in UofG)

However, some aspects of the UofG NDP policy enacted gave rise to some conflict with UESTC policy. Although a student's GPA in UofG is only based on years three and four of study (in line with many United Kingdom Universities), UESTC use all 4 years in the calculation. The consequence of a "free" progression into the following year would impact the GPA calculation. The compromise reached was that students in all years must sit the exams, but if they failed to reach the desired standard to progress, they were permitted to progress under the NDP. The students who "benefited" from this were usually the weaker ones and despite advice to resit the year, made the decision to progress regardless. Regrettably, it is anticipated that those students who elected to progress against the advice of staff may now be struggling.

The second impact of the NDP reflects a cultural difference between United Kingdom and Chinese students. In the United Kingdom, only a small number of students elected to resit an exam, and usually only where they had achieved poor results; most choosing instead to retain their first attempt grade. In contrast, the majority of the TNE students chose to resit even if their original mark was very good. This resulted in a large, unplanned marking load for staff (who were now engaged in teaching the following year cohorts). Out of a total of 1,464 students that undertook EoTAs in August 2020, 1,267 students availed themselves of the opportunity of retaking either the EoTAs or CAs in October. For future reference, careful consideration must be given to policies such as NDP to identify unintended consequences.

INFERENCES, REFLECTIONS, and RECOMMENDATIONS

The TNE policy planning and development was initiated soon after the onset of the pandemic in January 2020, with a range of revisions to the initial policy models implemented as circumstances changed. There was a need for informed decisions to be made to ensure any revisions made were robust and based on evidence. To facilitate the first set of revisions, staff and student feedback was sought, collected, and analyzed both during and after the Spring semester. To ensure an effective continuous review loop, a second phase of student feedback was conducted during Fall semester of AY 2020–21. To this end, it is important to note that the inferences given in this section are based on preliminary data and therefore should be treated as suggestive since the data is yet to be reported in academic literature.

In this section, first, a summary of the inferences from semester 2 (Spring) AY 2019–20 will be shared in *Inferences From the Spring Semester (AY 2019–20)*. Next, an initial feedback on the updated policy for semester 1 (Fall) AY 2020–21 will be presented in *Inferences From the Fall Semester (AY 2020–21)*. This will be a summary of the feedback gathered after revisions to the original policies were made and implemented, which aimed to assess if the policy review process had helped to improve student perception of the learning and teaching model in operation. Finally, *Recommendations* will layout the main recommendations made to assist the policy making process in situations where similar academic disruption takes place in future.

Inferences From the Spring Semester (AY 2019–20)

The main purpose of surveying students and staff both during and after the spring semester delivery was to gather data which would inform the management team on the perceived strengths and weaknesses of the "emergency" policies put in place, identify potential pitfalls, and provide evidence for improvements that could be made for future course and program delivery, in particular for the following academic year (AY 2020–21; Semester 1).

The crisis and the need for major change brought about an increase in the workload of TNE academic staff at UofG. Based on the initial L and T policy, lecturing staff were required to make, in some cases, quite dramatic adaptations to their course structure in an extremely short time frame. These changes included understanding a different teaching pedagogy as well as creating or adapting course content to align with an online delivery model. For instance, some staff members had to revert to simulations-based lab delivery for subjects which would normally be conducted through physical experimental setups. This needed considerable adjustments not only to the lab content, but also changes were needed to be made to lecture content to appropriately align lecture theory with the lab experiments.

An early feedback from staff focus groups yet to be reported in the academic literature suggests that the staff are appreciative of management realization about the challenges of transition to online delivery. It is possible that staff did not wish to be perceived as overly negative or obstructive, given the crisis facing all HE institutions.

Some initial feedback from students, on the other hand, showed signs of discomfort and anxiety in adjusting to online teaching and complained that home environment was not best suited for focused learning. Also, there were some suggestions around the improvement of IT facilities and broadband connectivity.

The opportunity to gather feedback through the systematic collection of data was very limited. However, the information gathered did serve a purpose; it highlighted the importance of engaging students and staff in the policy making process. It was possible to identify ongoing challenges people face and use this information as a vehicle for updating policies, to support learning, and to ensure that there is a focus on both student and staff well-being. It is also clear that maintaining a clear information flow for all parties is essential so they are able to understand the rationale behind the procedural and policy changes.

Inferences From the Fall Semester (AY 2020–21)

As mentioned earlier, the L and T delivery policy was amended, partly based on student and staff feedback, but also in reaction to changing circumstances in both China and the United Kingdom. During the implementation stage of this revised policy in semester 1 of AY 2020–21, staff and students were kept in the loop to identify any potential improvements.

It was noted that the staff were generally satisfied with the role of the GTA in the remote delivery and emphasized that the GTA role was overly demanding under current circumstance. Some of the platforms mentioned in the policy guidelines did not work as expected and a need of more inclusive online platform was identified.

Some preliminary student data was gathered which provided some valuable, if imperfect, insights into the policy implementation. The data is suggestive that very few students believed that online lectures could replace physical (face-to-face) lectures in the future. However, the students appeared to be more supportive of the use of technological tools and might be more comfortable with a hybrid approach, combining face-to-face delivery with online tools to support learning and teaching in the future.

The students were appreciative of the fact that lecture videos with subtitles supported the verbal communication. However, the students also highlighted the challenges regards to staying focused for long intervals during online delivery.

The feedback showed clear signs of improved student L and T experience delivered through the implementation of updated policies for semester 1, AY 2020–21. However, it was evident that it is extraordinarily challenging to replace physical delivery with an online system and therefore, there were still some areas of improvement that would need further reflection and update for semester 2, AY 2020–21.

Recommendations

Based on the data presented here, certain aspects of L and T delivery need particular attention to deal effectively with future unforeseen disruptions as have been faced this year. Staff are the main players in any L and T policy implementation and, therefore, should be involved throughout the policy development process so that their time, skillset, and resource limitations are considered. The most commonly occurring recommendations drawn from the data are:

- Student involvement through channels such as Student Representative Councils (SRCs) should be prioritized in order to develop policy development that meets student needs and requirements.
- All involved parties, including academic and administrative staff, students, and in the case of Chinese TNEs, parents, should be provided with clear and timely information to facilitate successful policy implementation.
- Technology should be harnessed to support student engagement. This requires regular good practice and knowledge sharing sessions amongst staff and students.
- Policy should include alternative approaches for delivery and assessment to mitigate technology failure and loss of internet connectivity.
- Academic staff should be trained and supported to develop their teaching practice based on online teaching pedagogies.
- Policies should take account of online teaching and learning challenges, such as the time to prepare teaching materials, student engagement issues and student attention span.
- More data, gathered over longer timeframes, should be collected to inform all future policy making.

CONCLUSION

Undoubtedly the impact of the COVID-19 virus has been one of the most significant to have affected the world and is expected to continue to impact all facets of life over many months. While there is little that an organization can do to guard against unknown threats or disturbances, there are actions, processes, and tools that managers can and should adopt to ensure early

detection of emerging threats. Using tried and tested planning tools, it is possible to construct a set of scenarios and analyze the likely impact on operations. Scenario planning is a well-known method used in strategic planning; it is less often used in crisis management, either in commercial enterprises or the Higher Education sector, and some basic training in the application of these tools beyond the organization's "first responders" would be prudent. In dealing with this crisis by using a combination of these classic crisis management methods and scenario planning, the management team of this TNE operation in both institutions were able to predict the likely impact on their students and estimate the severity of such impact. This early detection facilitated the development of a pro-active policy that placed the student at the center of the policy development process. Taking this approach allowed the implementation of online learning, teaching, and assessment to proceed in a well-managed and planned fashion. Through a reflective approach it was also clear that while every action was taken with the best intentions, some of the outcomes were more successful than others. An obvious example of this was the initial choice of asynchronous delivery of lectures; this was done to ensure

continuity of learning but failed to meet student-lecturer engagement expectations. In contrast to that was the recognition by students that developing autonomy in their learning was a positive and hitherto unconsidered outcome. The most significant lesson learned through this entire episode is the importance of communication between the TNE partners. Through the establishment of regular and formal update meetings, student learning, teaching, and assessment activities were able to continue in a planned and managed way despite the impact of sequential lockdowns on both Chinese and United Kingdom staff. While it is easy to be overly self-critical when in the midst of a crisis, looking back at what was achieved by the partnership over this incredibly difficult period was quite remarkable; like Neurath's mariners (Cartwright et al., 1996) we were able to reconstruct the vessel while at sea.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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It's a Challenge, Not a Threat: Lecturers' Satisfaction During the Covid-19 Summer Semester of 2020

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The summer semester had just begun at Austrian and German universities when Covid-19 was declared a global pandemic by the World Health Organization. Thus, in March 2020, all universities closed their campuses, switching to distance learning within the span of about a single day. How did lecturers handle the situation? Were they still able to turn the situation into a positive one? What were the main obstacles with this difficult situation, and where there conditions which helped them to overcome the new challenges? These are research questions of the present survey with a sample of 1,152 lecturers at universities in Austria and Germany. The survey focuses on the lecturers' appraisals of the novel situation as challenging or threatful. These appraisals are important for approaching a situation or shying away from it. However, how well a person adjusts to a novel situation is also influenced by personal and environmental resources which help to overcome the situation. The present survey focused on four possible sources of influence: internal assessments of the situation determining it to be threatening and/or challenging, personal resources, attitudes, and support by the organization. It was investigated to which degree these sources of influence could contribute to the lecturers' satisfaction (or dissatisfaction) with their teaching processes. A multiple regression with three criterion variables describing university lecturers' perceived satisfaction with distance teaching was carried out. Predictor variables were the lecturers' appraisals of challenge and threat, perceived support by the university and sense of belonging to the university, temporal resources, proficiency in using digital technologies, length of teaching experience, and gender. Lecturers were mostly satisfied with their teaching activities. Together with the perception of a low threat potential, challenge appraisals contributed strongest to satisfaction. In comparison,

assessments of actual personal resources, skills in the use of digital technologies, teaching experience, and temporal resources were important but contributed less to satisfaction than challenge appraisals. It seems that lecturers were only able to use these resources when the technological resources were available and when the lecturers were confident in their technical abilities.

INTRODUCTION

The Covid-19 disease was identified for the first time at the end of 2019 in Wuhan, in the People's Republic of China (Robert Koch Institute [RKI], 2020). The first confirmed Covid-19 case in the German-speaking realm was registered on January 27th, 2020 in Germany, and on February 25th in Austria. The summer semester had just begun at Austrian universities when on March 11th, Covid-19 was declared a global pandemic by the World Health Organization (WHO). To slow the spread of the virus, effective March 16th, extensive restrictions on many everyday activities were announced for all citizens by the Austrian federal government. In connection with these rapid developments, all universities closed their campuses, switching to distance learning within the span of about a single day (Kroisleitner, 2020; Neuhauser, 2020). In Germany, extensive travel restrictions were imposed on March 22nd. Here, universities decided in consultation with state and federal governments in mid-March 2020 to suspend all teaching until the end of the Easter break, which in most federal states was April 20th (German Rectors' Conference, 2020). On April 15th, it was decided in Germany that teaching should resume in the form of distance (mostly online) formats, with the exception of specific on-campus courses where learning and teaching would not work well in a distance format (for example with laboratory work) and where appropriate safety measures were in place. In addition, all instructors in higher education in both countries now had to work and teach from home. With schools and daycare facilities closed, parents also had to simultaneously take care of their children. Several media reports suggest that these circumstances were particularly challenging for early-career researchers working toward their Ph.D. or tenure (Kramer, 2020; Pettit, 2020). Distance education was maintained in both Austria and Germany throughout the summer semester of 2020. Similar developments were seen in other countries worldwide, impacting over a billion learners (United Nations Educational and Scientific and Cultural Organization [UNESCO], 2020).

How did lecturers[1] handle the situation? Were they still able to turn the situation into a positive one, and enjoy at least some satisfaction with their teaching? What were the main obstacles with this difficult situation, and which

conditions facilitated their coping with their new challenges? These are the research questions of the present survey that examined lecturers at universities in Austria and Germany (two German-speaking countries with basically identical academic tertiary education systems).

VARIABLES THAT MAY INFLUENCE LECTURERS' ADJUSTMENT TO NOVEL TEACHING AND LEARNING CONDITIONS

How well a person adjusts to a novel situation like the one experienced in the summer semester of 2020 is influenced by the demands and goals a person sets for her/himself as well as by the personal and environmental resources they encounter in the workplace (Lazarus and Folkman, 1984; Uphill et al., 2019). In the present survey, we focused on four possible sources that might influence how lecturers successfully adjusted to the novel teaching and learning situation arising from the Covid-19 pandemic: internal assessments of the situation determining it to be threatening and/or challenging, personal resources, attitudes, and support by the organization.

Appraisals of challenge or threat. When individuals are faced with difficulties, they usually appraise what is at stake and what opportunities of action are available. So-called primary appraisal is concerned with the significance of a situation and the possible threat or challenge it poses to the individual. When an evaluation focuses on risks and factors that lie beyond the individual's scope of action, the situation will be mainly perceived as a threat (Lazarus, 1999). In this case, individuals pay increased attention to the cues that signal their vulnerability and tend to withdraw from action (Wimmer et al., 2018). However, a new and difficult situation might also be perceived as a challenge or include elements of challenge offering opportunities for self-growth, gains in competences, satisfaction with the own performance, etc. When sizing something up as a challenge, individuals are more likely to shift to problem-solving, ultimately taking action to overcome adversity (Hase et al., 2019).

In comparison to primary appraisal, so-called secondary appraisal is concerned with the controllability of the situation. Secondary appraisal describes the degree to which an individual believes that she/he may control a difficult situation and influence the outcomes (Palmwood and McBride, 2019). Every situation has both threatening as well as challenging elements. They may however, differ in their degree of the challenges or

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[1]The term Universitätslehrende (translation university lecturers) used in the German-speaking realm for teaching staff at universities refers only to the activity of teaching and does not imply any specific contract or employment status. We will use the term "lecturer" in the following.

threats prevailing within them (Seery, 2011). To what extent an individual experiences states of challenge and threat is strongly affected by one's evaluation of personal resources and situational demands (Seery, 2011; Uphill et al., 2019). Here, different individuals may arrive at different appraisals of the same situation. It seems necessary to look not only at threat or challenge experienced by a person but also at the resources she/he disposes of.

Lecturers' personal resources and professional knowledge. The Covid-19 pandemic in the summer semester of 2020 certainly could be understood as both threatening and challenging, with lecturers suddenly having to meet new demands in their teaching. A United States survey carried out in May 2020 with nearly 4,800 faculty members saw 91% of them report that they had to transition their courses to remote teaching; another 7% had already been teaching fully online and kept teaching in this form; while only 2% reported that their class had been canceled or suspended (Fox et al., 2020a,b). For many, the situation required the rapid acquisition of new knowledge and skills in the use of online technologies and instruction. In the survey by Fox et al. (2020a,b), more than half of the lecturers reported a lack of online teaching experience when the Covid-19 pandemic started. These lecturers were almost twice as likely to report that they struggled to adjust their teaching than their experienced colleagues; they not only now had to change to online instruction, but also had to acquire new knowledge and skills in distance (mostly online) teaching, all within a very short period of time. It remains unclear the degree to which experience with traditional face-to-face courses may help deal with new situations like this that arise. On the one hand, experienced lecturers might be at an advantage if they can look back upon extensive teaching expertise and knowledge in managing instructional tasks like course design, class management, learning assessment, etc. (Chang et al., 2011). On the other hand, they might view the use of a new technology more reluctantly, experiencing difficulties in transitioning from traditional didactic concepts and courses to new online formats (Li et al., 2018).

Generally, the task of moving face-to-face lessons online requires significant time and effort for each course. In addition, the process of teaching online is not less time-consuming than traditional in-person teaching (Chen, 2003; Wanner and Palmer, 2015). For most teaching staff, a variety of tasks ranging from classroom instruction, teaching preparation, grading, administrative work, committee meetings, grant-writing, research, publishing, etc. had to be reconciled to match new teaching tasks. Parents, especially women, faced additional difficulties with schools and daycare facilities being closed. Working at home suddenly had to be juggled with child care (Kramer, 2020). It's therefore valid to assume that for many lecturers, the Covid-19 summer semester resulted in a higher work load and increased time demands. Female teaching staff might have been especially affected by teaching demands in this semester. Resources like time, professional experience, or external support may influence how well lecturers could manage the novel situation and its difficulties.

Sense of belonging to an organization, support by the organization. Obstacles at work feel easier to overcome if individuals identify with their organization. In these cases, they are more likely to perform their "work above and beyond their call of duty" (Mowday et al., 1982, p. 15; Wilkins et al., 2016) and show proactive behavior that protects or advances the organization. A sense of belonging forms an important dimension of organizational identification. It is defined as "the heavy identification with an organization, where the organization becomes part of their self-concept and the individual becomes psychologically connected to the organization in such a way that their own future is defined by the organization's future" (Dávila and Jiménez García, 2012, p. 245). Sense of belonging and identification is also related to the support provided by an organization. The degree to which employees identify with their organization also depends on the extent to which they experience their organization valuing their contributions and caring about their well-being, e.g., by providing them with resources, information, showing appreciation, etc. (Marique et al., 2012; Strayhorn, 2019).

Satisfaction (with one's teaching). The evaluation of the outcomes of one's behavior describes not only an assessment of former achievement but also helps to identify future goals and areas of improvement. A positive evaluation and an attribution of success to own efforts and behaviors has implications for the future. A person who believes to dispose of the skills and resources to succeed in a situation will be likely to approach similar situations in the future and give her/his best (Doménech-Betoret et al., 2017; Weiner, 2019).

Relationships between the variables. From the viewpoint of learning and teaching in tertiary education, it is important to know how satisfied lecturers were with their teaching outcomes in the summer semester. Such a summative appraisal of performance outcomes influences future behaviors, allocation of individual resources, and assessment of a situation (Eccles and Wigfield, 2002). Behaviors to manage a novel situation depend on how the situation is assessed, as a challenge that can be approached, or a threat which might be rather avoided. Individual, internal as well as external resources (e.g., professional experience, time for preparing instruction, technical facilities provided) should have an influence on how lecturers are able to manage (and in a wider sense to control) the novel situation (Ohly, 2019), e.g., by spending more time for preparation, using additional resources. Resources are intertwined with the assessment of the situation as being challenging or threatful. To understand how lecturers perceived the novel situation due to the Covid-19 pandemic is important for preparing them for possible difficulties in the future.

Against this background, the present survey investigates via a large sample of lecturers at universities in Austria and Germany how well they managed the situation and which aspects contributed most to their satisfaction assessments.

MATERIALS AND METHODS

Recruiting and Sample of Participants

From the beginning of June until the middle of July 2020, Austrian and German universities, universities of applied science,

and colleges of teacher education were contacted by e-mail and asked to distribute information about the survey to their teaching staff (Feldhammer-Kahr et al., 2021). All of the recruited institutions offer educational programs on ISCED levels 5 and 6 (UNESCO, 2011). Altogether, 44 universities in Austria and 64 universities in Germany were contacted by e-mail and asked to forward information about the survey to their teaching staff. The survey was conducted online and programmed with LimeSurvey.

A total of 1,339 lecturers took part in the study. Due to missing values, the analyses presented in this paper are based on a smaller data set of 1,152 participants. The sample included 636 female (55.21%) and 516 male (44.79%) lecturers. Of the participants, 785 were from Austria (68.14%) and 367 from Germany (31.86%). These lecturers teach at different types of institutions [comprehensive universities with majors in sciences, arts, humanities, etc. and technical universities (n = 774, 67.2%), universities of applied sciences (n = 219, 19.0%), and colleges of teacher education (n = 159, 13.8%)].

The participants held different professional degrees and were contracted to a variety of employment forms. Some participants also were employed at more than one university. Therefore, in the following 1,152 participants having 1,197 kinds of employment are described: 98 (8.5%) professorships with higher managerial responsibility (e.g., dean, head of department); 153 (13.3%) professorships which included the responsibility for a research group; 160 (13.9%) professorships without these managerial functions; 234 (20.3%) positions as research and teaching assistants on track toward a doctoral or post-doctoral qualification; 150 (13.0%) positions as research and teaching assistants without the obligations described above; 158 (13.7%) positions as teaching assistants; and 244 (21.2%) positions as lecturers with a temporary contract (with the term professorship we refer to the Austrian and German employment laws, which usually encompass specific formal academic qualifications and obligations for teaching and research; see also European University Institute, 2021).

Following the classification of scientific disciplines by the Austrian Federal Ministry of Education, Science and Research (Bundesministerium Bildung and Wissenschaft und Forschung, 2020), the participants worked in the following fields: engineering (construction, architecture, computer science, electro technology) (n = 137, 11.9%); natural sciences and mathematics (including agricultural, forestry, psychology, etc.) (n = 249, 21.6%); medicine and public health care (including life science and veterinary medicine) (n = 64, 5.6%); humanities, social, educational and communication sciences (n = 126, 10.9%); law, business and economics, business education (n = 101, 8.8%); linguistics, cultural sciences, esthetics, music (n = 212, 18.4%); educational sciences and technical methodology (n = 238, 20.6%); and theology, religious studies, and philosophy (n = 22; 1.9%; three missing values in the data set, 0.3%).

To reduce concerns about the traceability of participants, we did not ask for the participants' age. Participation was entirely voluntary and in accordance with the ethical standards of the institutional research committee. Informed consent was obtained from all participants of the study.

Measures

Satisfaction with teaching in the summer semester of 2020. Three items which had been used in previous studies on satisfaction in online-learning were employed (Paechter et al., 2010; Luttenberger et al., 2018). Participants estimated the degree to which they could successfully and meaningfully implement their instructional concepts online (successful implementation) and the degree to which they could expand their own knowledge and skills (knowledge gains) in the 2020 summer semester. They furthermore assessed their overall satisfaction with teaching in the summer semester. Assessments were made on a five-point scale ranging from 1 (low satisfaction) to 5 (high satisfaction).

Appraisal of challenge and threat. The challenge-threat scale by Drach-Zahavy and Erez (2002), which shows high reliability coefficients, was employed. The instrument measures challenge-threat appraisals in various work contexts. Eight items of the scale were employed; they had to be changed slightly for use in universities. For use in the present study, the instrument was translated from English to German and back translated. In the present sample, the structure of the questionnaire was investigated by means of principal axis factor analysis with orthogonal rotation (varimax with Kaiser normalization) in the present data set. Two factors were identified: Threat appraisals were measured by five items describing the respondents' perceptions of the expected consequences of the situation for them. Challenge appraisals were measured by three items describing the lecturers' overall expectations of success. Reliability indices measured by Cronbach's α were satisfactory, with α = 0.813 for the threat and α = 0.823 for the challenge scale. Item examples included: "The situation seemed like a threat for me." or "The situation provided opportunities to overcome obstacles." (original items used the word "task" instead of situation). Ratings were made on a five-point scale ranging from 1 (not true) to 5 (true). Thus, high values indicated high threat appraisal and high challenge appraisal, respectively.

Lecturers' resources. Teaching experience was measured by the item "How long have you been teaching at the university?" Answers here were categorized ranging from 1 (less than one year) to 5 (16 years or more); the scaling was chosen in accordance to previous studies (Chang et al., 2011). Furthermore, lecturers assessed their proficiency in using digital technology by one item on a scale ranging from 1 (not proficient at all) to 5 (highly proficient). Lecturers then assessed their temporal resources, i.e., time they have available for preparing and conducting lectures (mostly working in the home office). Assessments ranged from 1 (very few) to 5 (very high).

Sense of belonging and perceived support by the university. A questionnaire on the sense of belonging/identification with and support received by the university was developed based on existing measures (Zaussinger et al., 2016;

Arslan and Duru, 2017; Organisation for Economic Co-operation and Development [OECD], 2017; Marksteiner et al., 2019). Its structure was investigated by means of principal axis factor analysis with orthogonal rotation (varimax with Kaiser normalization) in the present data set. It yielded two factors with five items measuring belonging/identification (example item: "I feel appreciated by my institution") and two items measuring support ("I receive technical support by my institution," "I receive support concerning didactical issues"). Cronbach's α were satisfactory with α = 0.823 for belonging and α = 0.800 for support. Ratings on a five-point scale ranged from 1 (not true) to 5 (true). Here, high values indicated more positive assessments.

The study was performed in accordance with the American Psychological Association's Ethics Code and the Declaration of Helsinki. It was carried out within a larger project on learning and instruction which had been approved by the University of Salzburg. All participants gave their written informed consent to participate, and to confirm that their data were able to be used in an empirical study. The questionnaire can be found in the appendix. For regression analyses the software lavaan (Rosseel, 2012) was employed.

RESULTS

Descriptive statistics for variables are shown in **Table 1**. Correlations between variables are shown in **Table 2**.

For the length of teaching experience, the median was $Md = 3$ (six to ten years teaching experience); 74 (6.4%) of the participants had less than one year teaching experience, 263 (22.8%) one to five years, 245 (21.3%) six to ten years, 187 (16.2%) eleven to fifteen years, and 383 (33.2%) more than 16 years teaching experience ($n = 1,152$).

A multiple regression with three criterion variables was carried out to investigate which aspects contributed to lecturers' perceived satisfaction with distance teaching in the summer semester of 2020 (overall satisfaction, successful implementation of the instructional concept, knowledge gains in the summer semester). Predictor variables were the lecturers' appraisals of challenge and threat, their sense of belonging and perceived support of the university, temporal resources, proficiency in using digital technologies, and the length of teaching experience. Furthermore, gender was included as a predictor variable (the multiple regression analysis summary can be found in **Table 3**). We assumed a linear relation between independent (predictor) and dependent (criterion) variables, meaning we would expect that increases in one variable would be related to increases or decreases in another. lavaan software (Rosseel, 2012) was used for the multiple regression analyses because it supports the investigation of the relationship between a set of independent and dependent variables in one single regression. When interpreting results, it's important to note that multiple regression does not explain causes and effects, but instead describes the relations between variables or sets of variables.

Six variables significantly contributed to the overall satisfaction with one's teaching in the summer semester of 2020. Four variables obtained a positive β-weight: appraisal of challenge, temporal resources, proficiency in digital technologies, and perceived support by the organization (variables ordered according to their weight). Two variables were negatively associated with satisfaction: for appraisal of threat and length of teaching experience, higher values were related to decreased satisfaction. A high amount of variance (44.5%) could be explained by the regression equation.

Four variables significantly contributed to the assessment of whether lecturers could successfully implement their teaching concept; three of them obtained a positive β-weight: appraisal of challenge, proficiency in digital technologies, and temporal resources (variables ordered according to their weight). Appraisal of threat was negatively associated with the lecturers' assessment that they were able to implement their teaching concept well. Altogether, 36% of the variance could be explained by the regression equation.

Three variables significantly contributed to the lecturers' perceived knowledge gains: appraisal of challenge, sense of belonging, and length of teaching experience. A large amount of variance (52.1%) could be explained by the regression equation.

DISCUSSION

The present survey provides insights into lecturers' experiences in the Covid-19 pandemic during the 2020 summer semester as well as into the development of respective support measures to assist their transition from in-person to online teaching.

Sources of Satisfaction

Three aspects of lecturers' satisfaction were recorded in the survey: overall satisfaction, lecturers' satisfaction with the implementation of their instructional concept, and perceived knowledge gains.

Satisfaction with teaching during the Covid-19 summer semester. The mean and median of lecturers' satisfaction with their teaching activities (both above the scale mean of 3) indicates that the participants did in fact obtain a sense of satisfaction from the teaching situation. The situation was regarded as a challenge and had a lower potential of threat (mean and median below the scale mean of 3). It seems plausible that lecturers maintained a positive view of their teaching situation during the 2020 summer semester. The scale for challenge (Drach-Zahavy and Erez, 2002) with items expressing appraisal of the situation as an opportunity to gain knowledge and overcome barriers contributed strongly to satisfaction. As a corollary, perceived threat impaired satisfaction with the situation. The assessment of the situation as a challenge might be explained by the lecturers' positive assessment of their temporal resources, their proficiency in using digital technologies, as well as by the support of their organization, even though these variables received a lower weight in the regression equation. Challenge appraisals take an assessment of resources into consideration. However, they can

TABLE 1 | Descriptive statistics (*M*, *SD*, *MD*, *IRQ*, *min*, *max*), skewness, kurtosis.

	M	*SD*	*Md*	*IRQ*	*min*	*max*	**skewness**	**kurtosis**
Overall satisfaction	3.52	1.18	4.00	1.00	1.0	5.0	−0.52	−0.52
Successful implementation	4.00	1.00	4.00	2.00	1.0	5.0	−0.95	0.62
Knowledge gains	4.06	1.00	4.00	1.00	1.0	5.0	−1.08	0.88
Threat	1.60	0.70	1.40	1.00	1.0	4.8	1.40	1.91
Challenge	3.40	1.04	3.33	1.67	1.0	5.0	−0.32	−0.56
Sense of belonging	3.97	0.82	4.20	1.20	1.4	5.0	−0.72	−0.09
Perceived support	3.56	1.08	3.50	1.50	1.0	5.0	−0.41	−0.60
Temporal resources	3.48	1.16	4.00	1.00	1.0	5.0	−0.40	−0.62
Proficiency in digital technologies	4.05	0.81	4.00	1.00	1.0	5.0	−0.52	−0.12

Scale range from 1 (low satisfaction, challenge, threat etc.) to 5 (high). M, mean; SD, standard deviation; MD, median; IRQ, interquartile range; min, minimum; max, maximum. Sample size for all variables n = 1,152.

TABLE 2 | Correlations between variables (Spearman-Rho above, Pearson below primary diagonal).

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1 Overall satisfaction		0.587**	0.379**	−0.354**	0.478**	0.207**	0.261**	0.314**	0.209**
2 Successful implementation	0.602**		0.317**	−0.332**	0.396**	0.159**	0.178**	0.201**	0.297**
3 Knowledge gains	0.394**	0.352**		−0.035	0.648**	0.179**	0.167**	0.083**	−0.001
4 Threat	−0.339**	−0.316**	−0.031		−0.046	−0.195**	−0.127**	−0.212**	−0.325**
5 Challenge	0.490**	0.423**	0.682**	−0.055		0.152**	0.191**	0.120**	0.031
6 Sense of belonging	0.214**	0.160**	0.168**	−0.181**	0.156**		0.496**	0.147**	0.047
7 Perceived support	0.278**	0.201**	0.168**	−0.140**	0.194**	0.490**		0.208**	0.037
8 Temporal resources	0.311**	0.205**	0.087**	−0.216**	0.129**	0.153**	0.229**		0.068*
9 Proficiency in digital technologies	0.220**	0.307**	0.020	−0.329**	0.048	0.053	0.062*	0.071*	

*p < 0.05; **p < 0.01.

be regarded as immediate assessments and important factors for the decision to approach a situation and to invest effort (Hase et al., 2019). Therefore, it is plausible that challenge appraisals received a higher weight in the regression analyses. Longer teaching experience was somewhat surprisingly related to lower satisfaction. It might have been that these lecturers had a wider range of experiences and best-practice examples for teaching which served as a frame of reference for their more negative evaluation. Gender contributed to none of the satisfaction measurements.

Successful implementation of one's teaching concept. The mean and median of 4.00 for the items indicates that the participants were mostly satisfied with how they implemented their online teaching concept. Again, the perception of the situation as a challenge strongly contributed to satisfaction with the own teaching. Appraisal of the situation as a threat or challenge were the strongest contributors in the regression analysis. Stronger appraisal of the situation as a threat, a focus on one's own deficiencies, and lack of knowledge diminished satisfaction. Not surprisingly, proficiency in use of digital technologies, in combination with sufficient time for moving instruction to an online format, and carrying out distance teaching contributed positively to satisfaction.

Knowledge gains in the teaching situation. The mean value of 4.06 (median 4.0) for the item indicates a positive assessment of individual knowledge gains in the Covid-19 summer semester of 2020. Appraisal of the Covid-19 situation as a challenge was

again the strongest predictor of lecturers' positive assessment. However, a sense of belonging also positively contributed, and probably served as a motivator for learning (Stoll et al., 2006). Somewhat surprisingly, longer teaching experience was positively related to higher perceptions of knowledge gains. Lecturers with longer experience and who were older in age probably already had well-established traditional teaching concepts in place, and needed to overcome more obstacles to transition their courses online; thus, they might have experienced a wide range of chances for knowledge gains. Or from the viewpoint of younger lecturers: it could be that they had already taught online, or at least were more eager to embrace online technologies, and could rely on their existing knowledge, whereas older lecturers had to obtain new knowledge and skill sets (see also Wingo et al., 2017).

The Role of Challenge and Threat Appraisals in Comparison to Personal and Organizational Resources

Looking closer at the job characteristics of lecturers can help provide greater insight into this study's results. University lecturers typically enjoy high responsibility along with high autonomy in their work (Sharma and Jyoti, 2009). The activity of teaching itself, e.g., being able to establish a relationship with students is also mostly regarded as a satisfying element of the profession (Szromek and Wolniak, 2020), constituting a source

TABLE 3 | Summary of the multiple regression analysis (regression coefficients, significance).

	Overall satisfaction				Successful implementation of teaching concept				Knowledge gains			
	B	SE B	β	Sign.	B	SE B	β	Sign.	B	SE B	β	Sign
Threat	−0.482	0.050	−0.248	***	−0.376	0.052	−0.208	***	0.032	0.055	0.015	
Challenge	0.563	0.031	0.436	***	0.472	0.033	0.392	***	0.980	0.041	0.704	***
Sense of belonging	0.052	0.044	0.032		0.028	0.047	0.018		0.121	0.051	0.069	*
Perceived support	0.127	0.034	0.102	***	0.065	0.038	0.056		0.021	0.038	0.016	
Temporal resources	0.220	0.028	0.190	***	0.099	0.031	0.092	**	−0.012	0.031	−0.009	
Teaching experience	−0.063	0.026	−0.063	*	−0.006	0.027	−0.006		0.057	0.027	0.053	*
Proficiency in digital technologies	0.180	0.044	0.109	***	0.364	0.047	0.237	***	0.002	0.044	0.001	
Gender	−0.053	0.071	−0.020		−0.072	0.073	−0.029		−0.059	0.075	−0.020	
R^2	0.445				0.360				0.521			

B, unstandardized regression coefficient β; SE B, standard error of B; β, standardized regression coefficient. *p < 0.05; **p < 0.01; ***p < 0.001. Sample size n = 1,152.

of social support, something seen as an important job satisfaction variable (Gerich and Weber, 2020). Even in a novel and difficult situation like the one experienced during the summer semester of 2020, there were still certain degrees of freedom for implementing new instructional concepts.

The results indicate that the lecturers were mostly satisfied with their teaching activities, and felt they were able to overcome the barriers presented by the situation. Altogether, they emphasized the merits of challenge appraisals. Together with the perception of a low threat potential, challenge appraisals contributed strongest to satisfaction. Appraising the teaching situation as a challenge was related to a focus on the opportunity for self-growth and gains in knowledge and skills (when considering single item formulations). These kinds of challenge appraisals are usually associated with more positive expectations for success (Skinner and Brewer, 2002).

In comparison, assessments of actual personal resources, skills in the use of digital technologies, teaching experience, and temporal resources were important but contributed less to satisfaction than challenge appraisals. It should be noted that the participants regarded their temporal resources as well as their skills and knowledge in the use of digital technologies rather favorably and as sufficient for their teaching. With this in mind, the mere disposal of resources appeared insufficient for handling difficulties experienced in the Covid-19 semester successfully, and needed to be accompanied by confidence in the own ability to overcome barriers, along with an attitude that the situation would also offer opportunities for self-growth and knowledge gains.

Implications for Universities

The above results are important for how universities can support their teaching staff in difficult situations like the one encountered in the summer semester of 2020.

Technical and didactic support contributed to the lecturers' overall satisfaction as well as to their assessment of a successful transition to online teaching. This support can be provided in various forms. Many universities expanded their digital learning infrastructure by upgrading existing software tools, providing new software and hardware, upgrading hardware infrastructure, or rolling out new collaboration and video conferencing software. Didactic support included measures like counseling from discipline-specific experts, providing didactic information via newsletters, *ad hoc* web courses, peer review, etc.[2]

A qualitative analysis of the participants' additional responses to open questions about their individual needs for support by their institution (Tulis et al., 2021) confirmed the suggestions above. More than the half of the participants used this optional possibility to express the kind of support they would require or find helpful from their university. Most of them indeed focused on technical support (e.g., workshops, IT support, equipment, and software tools) but also on the provision of concepts for online teaching and online learning assessments by their university. Because threat

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[2]See https://www.uni-hildesheim.de/e-learning2020/

appraisals are partially based on the experience of having insufficient resources to meet situational demands (Blascovich and Mendes, 2000), this kind of support may enhance lecturers' perceived resources.

Temporal resources for planning, preparing, and implementing online teaching, and working from home during the Covid-19 semester were also significant predictors of satisfaction. Institutions can support lecturers' limited time in various ways, e.g., by providing support from technical staff for moving instruction online, in the form of support in case of problems, or by providing good-practice examples including various learning scenarios that can be exported and adapted by lecturers. Further measures could include fostering production and collaborative re-use of teaching materials, e.g., by providing access to Open Educational Resource (OER).[3]

Lecturers' proficiency in using digital technologies was also a significant predictor of satisfaction and the positive evaluation of one's teaching. This finding points to the importance of training measures for teaching staff. Long-term, lecturers' self-assessments are strongly related to the universities' didactic support of their teaching staff, along with their human resource development. This might include training programs, on-the-job training, qualification opportunities for all career stages, and individual measures like coaching and mediation[4].

The results of the survey emphasize lecturers' assessments of the situation as a challenge as an important contribution to satisfaction; these assessments are connected to personal resources and attitudes. Appraisal of the situation as a challenge contributed positively to satisfaction. Different explanations are possible; one might be that the lecturers received sufficient support, that they felt they were able to overcome difficulties of the new situation.

Altogether, the results advocate not one or a few specific technological, organizational, or other measures, but speak in favor of bundles of measures that can be tailored to individual lecturers' needs. From an organizational view point it would be also interesting and important to identify groups of lecturers with similar needs so that courses, support, or services could be administered to a group instead of a single person.

Universities already offer their teaching staff larger degrees of freedom for fulfilling their complex tasks. These degrees of freedom should of course be maintained, and support measures should take individual needs and resources into consideration. This would for example mean not proposing a single technical solution or a sole didactic concept for an entire organization, but instead providing different solutions which fit individual demands or the needs of specific groups (e.g., teaching staff in a specific major). Although universities cannot offer an unlimited range of technological tools or support, within a certain framework, it should nevertheless be possible to consider individual needs and resources. The results of this survey recommend considering lecturers' very individual assessments of teaching situations, providing them with customized support measures, and raising their proficiency in an effort to hopefully achieve assessments from them that understand situations like the Covid-19 2020 summer semester as challenging but manageable.

LIMITATIONS AND OUTLOOK

Partly, limitations of this study concern the design of the survey. It has to be kept in mind that the cross-sectional design poses limitations on the causal interpretation of data; on the other hand, the design made it possible to investigate a large group of participants. Other limitations concern the voluntary self-recruitment of participants (Fricker, 2012). Tertiary higher education institutions were contacted by e-mail for this study and asked to distribute the online questionnaire among their teaching staff. The research team had an influence on neither the universities' nor the lecturers' willingness to contribute. This kind of selection bias is nearly unavoidable in surveys with voluntary participation. Descriptive statistics point at the participants' high satisfaction with the teaching situation in the summer semester of 2020. Perhaps a self-selection of lecturers having more positive attitudes occurred. However, even in this (self-)selected group of participants, challenge appraisals and a positive outlook on the situation were important. If this was in fact the case, this means it will be even more important to strengthen lecturers via a more critical assessment of resources, supporting them in experiencing this kind of difficult situation as a challenge and an opportunity to learn.

Altogether, the results point at variables that are able to explain satisfaction; interestingly an appraisal of the novel situation as challenging resulted in higher satisfaction. The results deliver valuable information for institutions in higher education about how to perceive and support their teaching staff. They also point at measures of support. By providing a broad range of services and resources tailored to individual needs, universities can help their teaching staff overcome difficulties. Considering that lecturers before the Covid-19 crisis were found to be reluctant to do distance teaching, with the lack of institutional support and time commitment being the main concerns (Wanner and Palmer, 2015; Feldhammer-Kahr et al., 2019), the Covid-19 situation delivered opportunities to expand existing support measures and thus foster teachers' confidence and the future use of distance learning.

The present survey was carried out in an extraordinary situation which could not have been foreseen by anyone and which demanded a lot from educators. The results provide a snapshot and can be understood as a description of how lecturers assessed and handled the first Covid-19 semester. At the present time universities face their third semester of online teaching. For a deeper understanding it would be important and interesting to carry out further surveys and to know more whether and how lecturers adapted to the situation and

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[3]for example, www.oernds.de/

[4]for example, personalwesen.univie.ac.at/en/services-for-employees/human-resources-development/; personalressort.uni-graz.at/de/abteilungen/personal-und-organisationsentwicklung/

whether their assessments of and their engagement in the situation changed.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

MF-K, MT, EL-T, SD, DM, MA, and MP made a substantial, direct and intellectual contribution to the work, and approved it for publication. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

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The Perceived Impact of COVID-19 on Student Well-Being and the Mediating Role of the University Support: Evidence From France, Germany, Russia, and the UK

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The rapid and unplanned change to teaching and learning in the online format brought by COVID-19 has likely impacted many, if not all, aspects of university students' lives worldwide. To contribute to the investigation of this change, this study focuses on the impact of the pandemic on student well-being, which has been found to be as important to student lifelong success as their academic achievement. Student well-being has been linked to their engagement and performance in curricular, co-curricular, and extracurricular activities, intrinsic motivation, satisfaction, meaning making, and mental health. The purpose of this study was to examine how student perceptions of their degree completion and future job prospects during the pandemic impact their well-being and what role university support plays in this relationship. We used the conservation of resources theory to frame our study and to develop five hypotheses that were later tested via structural equation modeling. Data were collected from 2,707 university students in France, Germany, Russia, and UK via an online survey. The results showed that university support provided by instructors and administration plays a mediating role in the relationship between the perceived impact of COVID-19 on degree completion and future job prospects and levels of student well-being. Student well-being is decreased by their concerns for their degree completion but not by their concerns for future job prospects. In turn, concerns for future job prospects affect student well-being over time. These results suggest that in a "new normal," universities could increase student well-being by making support to student studies a priority, especially for undergraduates. Also, universities should be aware of the students' changing emotional responses to crisis and ensure visibility and accessibility of student support.

Keywords: COVID-19, university students, subjective well-being, university success, job prospects

INTRODUCTION

Student well-being has become a concern for many colleges and universities globally as they acknowledge the importance of a balance between psychological, social, emotional, and physical aspects of student lives (e.g., Flinchbaugh et al., 2012; Mahatmya et al., 2018). Student well-being could be understood as "reduction in stress, enhanced experienced meaning and engagement in the classroom, and ultimately, heightened satisfaction with life" (Flinchbaugh et al., 2012, p. 191). Student well-being includes concepts of motivation, identity, self-esteem, self-efficacy, and self-regulation in the context of learning and matriculating through the program to get a degree (Willis et al., 2019). Student well-being has shown to increase their engagement in learning activities, meaning making, a sense of belonging, positive relationships with others, autonomy, and competencies (Sortheix and Lönnqvist, 2015; Baik et al., 2016; Cox and Brewster, 2020) and reduce their burn-out, stress, frustration, dissatisfaction, and withdrawal from active learning (Flinchbaugh et al., 2012; Mokgele and Rothman, 2014; Yazici et al., 2016). Therefore, well-being not only fosters student academic achievement, but also prepares students for lifelong success (Mahatmya et al., 2018). Not surprisingly, many universities across the globe have decided to make well-being their central strategic goal. For example, in Europe, seven universities from seven different regions along with over 100 partnering organizations formed the European University of Well-Being—EUniWell—to promote well-being of students, staff, and communities. Meanwhile, Schools for Health in Europe Network Foundation (2019) is working on health and well-being standards and indicators that offer guidelines to promote health in schools in Europe. In the United Kingdom, the Higher Education Policy Institute (2019) and Advance Higher Education work together to monitor student well-being by continuously collecting and analyzing data from full-time undergraduate students. In the United States, George Mason University, VA, has implemented a university-wide "Well-Being University Initiative" that is coordinated and advanced by a specially created center. The University System of Georgia, USA, has adopted a similar vision of a well-being culture to enhance lives of its community.

Prior to the pandemic, levels of well-being among college students were troublesome (Poots and Cassidy, 2020). For example, in the United States, only one in 10 students graduating from universities measured high in all elements of well-being (Gallup, 2020). In the United Kingdom, undergraduates were reported to have lower well-being than the general population and their well-being was in decline for several years (Higher Education Policy Institute, 2019). This unfortunate state of well-being among students undoubtedly has been devastated by the pandemic that has brought suffering, frustration, discomfort, fear, loss, and other negative emotions and experiences. Students across the world have suddenly been expected to work and learn online, which requires access to good IT infrastructure and equipment, connectivity, and different digital and cognitive skills. Students worry not only about the infection risk but also about their degree completion and unemployment upon graduation,

which impacted their well-being even prior to the pandemic (Moate et al., 2019).

Since the outbreak of Covid-19, research has shown the psychological impact of the pandemic on university students and discussed the coping solutions. For instance, disruptions in academic processes due to Covid-19 pandemic have increased student anxiety (Wang et al., 2020), especially for those without adequate social support (Cao et al., 2020). Other health risks, such as depression, alcohol and drug consumption, and eating disorder symptoms, have been reported among German university students (Kohls et al., 2020). Consequently, students with lower levels of mental well-being experience more stress about their academic activities and decreased self-efficacy, satisfaction with coursework, and sense of belonging to university (Capone et al., 2020). Stress also has been found to decrease medical students' enthusiasm to learn and practice medicine upon graduation (Ye et al., 2020). The pandemic has also increased student workload, uncertainty about the semester completion, and confusion about study expectations, which resulted in higher stress levels (Stathopoulou et al., 2020; Van de Velde et al., 2020). Due to the limited social life during the pandemic, these students have also reported feeling lonely, anxious, and depressed (Essadek and Rabeyron, 2020). Prior studies highlighted some coping solutions; for example, students searching for information about the pandemic (Capone et al., 2020; Wathelet et al., 2020) and for meaning in life (Arslan et al., 2020) have higher levels of mental well-being. Students who spend much time on social media platforms and have strong motivation for online learning also report lower levels of distress (Al-Tammemi et al., 2020). Surprisingly, Capone et al. (2020) found no significant deviation in levels of stress and mental well-being from the accepted norm among college students in Italy.

These and other researchers (e.g., Li et al., 2020; Zhai and Du, 2020) call for better understanding of the impact of COVID-19 on student psychological states. First, colleges and universities across the globe need to identify and adopt strategies and resources to address the impact of COVID-19, which is likely to be long lasting. These strategies would include a revision of the existing practices and interventions at the curricular, co-curricular, and extracurricular levels (e.g., Yamada and Victor, 2012; Maybury, 2013; Kareem and Bing, 2014; Mokgele and Rothman, 2014) and at the university-wide level (Mahatmya et al., 2018). Second, COVID-19 has created much uncertainty about "a new normal" in student learning and university functioning. Currently, when most countries are still responding to the pandemic, it seems possible, if not likely, that the change to online or hybrid modes of learning will become more prevalent in colleges and universities across the globe. Therefore, new strategies and resources need to be developed to improve student well-being in the online or hybrid environment. Third, to find effective strategies and resources, colleges, and universities have to identify and understand factors and mechanisms through, which COVID-19 affects student well-being. Consequently, this study sought to examine how student perceptions of their degree completion and future job prospects during the pandemic impact their well-being and what role university support plays in this relationship. To achieve this goal, the study used four scales to

collect self-reported data from students in four countries, such as France, Germany, Russia, and the United Kingdom (UK).

Our research contributions are three-fold. First, the study contributes to the emergent knowledgebase of the impact of COVID-19 on student well-being in general (e.g., Al-Tammemi et al., 2020; Capone et al., 2020; Li et al., 2020) and student well-being in France, Germany, Russia and UK in particular (e.g., Essadek and Rabeyron, 2020; Kohls et al., 2020; Savage et al., 2020). Our findings could contribute to the research on the impact of COVID-19 on students and help the higher education sector internationally develop appropriate strategies. Second, this study identifies the key factors affecting students and their learning during the lockdown period and helps understand adjustments needed for the "new normal" learning environment. We argue that the change to an online or hybrid mode of learning will be the "new normal" for teaching, and, hence, we need to explore and find evidence for students to effectively deal with and learn in an online and hybrid environment. Third, using the conservation of resources theory (CoR; Hobfoll, 1988, 1989), we enrich the application of prior student well-being research and provide a theoretical framework that helps understand the mechanism of university support on student well-being.

In the following sections, we introduce the concept of student well-being, provide an overview of the CoR theory (Hobfoll, 1988, 1989), and review resources that universities provide to enhance student well-being. Then we develop hypotheses, describe the study methodology, and present the results and discussion. We conclude with research limitations and future research direction.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Conservation of Resources Theory

The CoR theory (Hobfoll, 1988, 1989) suggests that people experience stress when they feel the threat of resource loss, a real net loss of resources, and/or a lack of gained resources after resource investment. Two types of resources are examined by this theory. On the one hand, individuals' external resources are object resources (e.g., for university student, laptop for taking online courses, living expenses), social resources (e.g., family help), and condition resources (e.g., stable internet and digital support offered by the university). On the other hand, individuals' internal resource includes personal resources (e.g., self-efficacy and self-control during distance learning) and energy resources (e.g., time and health; Chen et al., 2015; Hagger, 2015). The CoR theory is relevant to better understand the impacts of Covid-19 on university students' well-being as they need to follow fully or partially online courses, they are forced to reduce the social activities to the minimum level, and they should try to manage daily life in the new normal. Simultaneously, Covid-19 remains an international threat to both life and economies, resulting in widespread public nervousness This continuing global pandemic concurrent with the changes in university life are likely to decrease student well-being.

Applying the CoR theory to the current pandemic, Ojo et al. (2020) found that individual reaction and subsequent response to the crisis varies. Some people can bounce back easily and shortly (Luthans et al., 2006; Malik and Garg, 2020) while some people will develop the symptoms such as depression or other psychiatric disorders. University students who are able to optimize the resource gains, cope with changes in daily life, and manage their emotions are more likely to perceive the crisis positively. This in turn not only shows their current level of resilience but additionally enables them to develop their resilience capability. Within this dynamic process, their resilience has served to reduce the stress (Vinkers et al., 2020). In this vein, while students are balancing the resource gains (e.g., university support) and resource loss (e.g., change-related stressors), they show different levels of resilience and which affect their capability to maintain well-being.

Student Well-Being

Some researchers explain well-being in terms of equilibrium by stating that everybody has a baseline of happiness. According to Headey and Wearing (1991), resources, psychic incomes, and subjective well-being are in a dynamic equilibrium. This equilibrium comprises "physical well-being, plenty of physical resources; absence of fatigue; psychological well-being and evenness of temper; freedom of movement and effectiveness in action; good relations with other people" (Herzlich, 1974, p. 60). From this perspective, well-being could be defined as the balance point between an individual's resource pool and the challenges faced (Dodge et al., 2012; Chen et al., 2015).

During their program completion under the impacts of COVID-19, students face numerous challenges, demands, and turbulences that influence their well-being. For example, they experience diverse social and economic pressures (Wood et al., 2018), have to balance their education, family, and work responsibilities (Moate et al., 2019), and encounter social isolation, discrimination, language barriers, and cross-cultural differences (Daddow et al., 2019). To successfully address these demands and succeed in their pursuit of education and a profession, students at all levels of education and across all disciplines have to have timely and adequate resources (Mokgele and Rothman, 2014; Wood et al., 2018). These resources help to address students' needs and, hence, reduce their burn-out and stress and increase their engagement in learning activities, meaning making, and life satisfaction (Flinchbaugh et al., 2012).

Universities can deploy these resources via curricular, co-curricular, and extracurricular activities (Flinchbaugh et al., 2012; Yamada and Victor, 2012; Maybury, 2013). In the classroom, clear assessment criteria, classroom policies, and project deadlines can eliminate student frustration, dissatisfaction, and withdrawal from active learning (Mokgele and Rothman, 2014). Sports and physical activity have also been shown to decrease depression and stress and increase student well-being (Yazici et al., 2016). Campus libraries contribute to promoting student well-being by ensuring easy access to learning resources and a learning space for all students (Cox and Brewster, 2020). These practices can also help students to increase intrinsic motivation to learn, voice their concerns, enact their identities, and make sense of their

experiences. In contrast, a campus environment that does not efficiently address unhealthy and unethical social interactions, for example, bullying (Chen and Huang, 2015), cyberbullying (Musharraf and Anis-ul-Haque, 2018), and cyber dating abuse (Viillora et al., 2020) increases student depression and anxiety and decreases student quality of life. This can lead to students starting to feel less happy and less intrinsically motivated to learn, which affects their well-being.

The Perceived Impact of COVID-19 on Degree Completion and Student Well-Being

During COVID-19, more than 100 countries implemented either nationwide or local "lock-down" measures at least once. Such closures meant that face-to-face courses have been transitioned to online learning (Kwok et al., 2020). The impact of COVID-19 on student life becomes significant. These can be, for example, experiencing more workload, adapting oneself to an online learning mode immediately, or moving back to home without sufficient preparation but can also include more worries due to uncertainty and fear of pandemic. In addition, the impact of COVID-19 on each student varies. Some students have limited access to connectivity; some do not have adequate IT equipment to attend online classes, and others cannot afford the extra cost to improve their IT resources (UNESCO, 2020). Meanwhile, students' subjective socioeconomic loss affects their life outcomes. In their study, Kohls et al. (2020) argue that income changes during the pandemic affect the levels of depressive symptoms. In other words, socioeconomic loss leads to increasing stress. For instance, many students rely on part-time jobs to gain their living expenses, and due to the lockdown and economic crisis, they either cannot get a renewed contract or they become unemployed. Unemployment leads not only to earning loss, but also to psychosocial asset loss, social withdrawal, and psychological and physical well-being loss (Brand, 2015). All in all, the unavailable external resources can impact the student learning experience, for example, interrupted learning, lack of participation in in-class discussion, absenteeism in class, and restraints to taking their final exams, all of which can result in students accepting lower-status jobs in order to survive. Additionally, some students have also faced discrimination (Hardinges, 2020) during COVID-19, which may lead to mental health problems (Kang et al., 2020). Students from minority groups (e.g., Asian students, in particular the Chinese) have encountered social isolation and stereotypes, which could impact their student experience and job prospects.

Furthermore, the impact of the COVID-19 outbreak on the world has been substantial. With insufficient knowledge of the virus and no available vaccine for months, students may be prone to develop more negative emotions. Prior studies have shown that negative emotions have a critical impact on well-being (Gross, 2015; Puente-Martínez et al., 2018). Students may experience real and potential loss of resources and a mismatch between task demand at the universities and their resource availability (Hagger, 2015). With the increasing negative emotions, their

well-being could be affected as they become more concerned about the impact of COVID-19 on their studies.

We, therefore, predict that COVID-19 would lead to students' negative well-being because students may experience more stress related to uncertainties in their academic success, negative economic impact, and lack of perceived support (Cao et al., 2020). Meanwhile, students would feel the need to deploy more time and energy to protect themselves against and recover from resource loss (Hobfoll et al., 2018) in order to avoid putting their well-being at risk. We propose the following hypothesis:

H1: The perceived impact of COVID-19 on student concerns for degree completion will negatively predict levels of student well-being.

The Perceived Impact of COVID-19 on Student Concerns for Future Job Prospects and Student Well-Being

COVID-19 has triggered a worldwide economic recession (OECD, 2020). With the lockdown measures implemented by many governments, business opportunities become restricted in many sectors and unemployment is rising. Many companies have reported layoffs. As predicted during the first wave of the pandemic by OECD (2020), the second wave of infections in late 2020 worsened the economic situation, and more companies suffered from the economic crisis, which has impacted job losses, financial well-being, and standards of living. As a result, students search for job opportunities to ensure their return on education investment would be limited. Thus, there are more job demands than supply. According to the CoR theory, when resources are lost or perceived to be threatened, people experience stress and are motivated to gain back their resources (Baer et al., 2018). Under the economic lockdown and recession, more students may have difficulties in finding jobs and/or internships, which could negatively affect students' self-esteem (personal resource) and their individual economic well-being (object resource) for instance. Without a guarantee to job prospects, students feel more stressed about their future and return on education investment, which decreases their engagement in learning activities and increases their negative emotions (Flinchbaugh et al., 2012). Therefore, the more concerned students feel about the impact of COVID-19 on their future job prospects, the lower their level of well-being and the higher the level of negative affect. We suggest the second hypothesis:

H2: The perceived impact of COVID-19 on student concerns for future job prospects will negatively predict levels of student well-being.

The Mediating Role of University Support

Universities play an important role in ensuring and increasing student well-being. In the classroom, specific interventions, including positive psychology assignments (Maybury, 2013), stress management and journaling (Flinchbaugh et al., 2012), and mindful awareness practices (Yamada and Victor, 2012) have been shown to improve student well-being. A supportive and enabling environment on campus has been proved to ensure

student well-being (Kareem and Bing, 2014; Daddow et al., 2019) by fostering their sense of belonging, positive relationships with others, autonomy, and competencies (Baik et al., 2016). For example, through informal social interactions students explore and relate to individual, group, and even the entire university values, which increases their well-being (Sortheix and Lönnqvist, 2015). Mahatmya et al. (2018) describe a set of integrated and interrelated courses that incorporate both traditional and experiential learning activities for undergraduate students. To monitor and manage student well-being outside the classroom, universities provide other services and interventions, including, for example, stress management (Mokgele and Rothman, 2014), counseling (Kareem and Bing, 2014), inter-faith, and cultural diversity programs (Daddow et al., 2019). In summary, these services and interventions represent the support that students can access and, therefore, can make students feel more positive about their resource gains. The perceived impact of COVID-19 may result in students perceiving university support to be limited, insufficient, or non-existent. Therefore, students would need extra resources to achieve the university success and increase their well-being. Therefore, we propose the following hypothesis:

> H3a: University support will mediate the relationship between the perceived impact of COVID-19 on student concerns for degree completion and levels of student well-being.

Similarly, students need support from their universities to increase their chances of employment before and upon graduation (McMurray et al., 2016; Donald et al., 2018). These are activities and initiatives provided by academic and student services, campus libraries and student organizations to help students cope with the study demands, develop professional networks, practice job interview skills, write resumes, and gain internships. However, COVID-19 has greatly impacted these resource offering. For example, career services would typically provide more support in a face-to-face format (e.g., career fairs and case championships), but now universities may face difficulties (e.g., time, money, and available talent) to develop effective comparable online services. If universities help students find jobs and internships, students could feel supported, less stressed, and more optimistic about their future careers. Hence, we propose the following hypothesis:

> H3b: University support will mediate the relationship between the perceived impact of COVID-19 on student concerns for future job prospects and levels of student well-being.

METHODOLOGY

Sample and Procedure

The sample was collected from university students in France, Germany, Russia, and UK between April and June, 2020. In total, 2,707 questionnaires were collected. However, 765 had missing values; after removing them, 1,932 observations were included for further analysis. Out of these 1,932 participants, 119 were recruited from UK, 227 from Russia, 1,314 from Germany, and 272 from France (see **Table 1**). From the students in the sample

TABLE 1 | Demographics.

Variables		Frequency	Percent
Country	Russia	227	11.7
	The UK	119	6.2
	Germany	1,314	68.0
	France	272	14.1
	Total	1,932	100.0
Gender	Male	691	35.8
	Female	1,233	63.8
	Other	8	0.4
Residing	Home	1,324	68.5
	Still on campus	81	4.2
	With friends	36	1.9
	With family	432	22.4
	Other	59	3.1
Study mode	Full time	1,644	85.1
	Part time	204	10.6
	Other	84	4.3
Study year	Undergraduate year 1	559	28.9
	Undergraduate year 2	519	26.9
	Undergraduate year 3 (Placement/Study Abroad)	148	7.7
	Undergraduate year 3 (Final year)	277	14.3
	Undergraduate year 4 (Final year)	122	6.3
	Post-graduate year 1	192	9.9
	Post-graduate year 2	96	5.0
	Post-graduate other	19	1.0

63.8% were female, 35.8% male, and 0.4% other. The mean age was 22.87 years old. Most students lived at home (68.5%) and studied full-time (85.1%). Over half of the respondents were first- and second-year undergraduate students.

The questionnaire was administered with Qualtrics XM software. Participants received the link and filled in the questionnaire individually, voluntarily, and anonymously. The project followed ethical standards of research required by each participating university.

Measures

The first part of the self-reported questionnaire consisted of demographic details such as gender, age, country, place of residence, study mode, and study year. The main part of the questionnaire included the following four scales.

University Support

University support was measured by asking students to rate to which extent they got support from their lecturers and universities. Two items reflected university support and were measured on a 5-point Likert scale (e.g., Please rate these as they apply to your current experience: I get support that I need from the following:—My lecturers). This was based on the social

support scale developed by Pierce et al. (1991). Good internal consistency was achieved ($\alpha = 0.72$).

Well-Being

Well-being can be conceptualized as having such components as valence and intensity (Warr, 2003). Therefore, two scales were used to capture well-being in different states: in the moment and general.

In the Moment Well-Being

To test the valence of student well-being in response to predictors, it is important to represent well-being in terms of independent dimensions of positive and negative emotional states (Tellegen et al., 1999). In the moment well-being was measured by a 5-point Likert scale developed and validated by Russell and Daniels (2018). This scale helps to measure specific positive and negative emotional states relevant to a particular event in time, or "right now." This ensures affect is measured at its lowest level in terms of duration demonstrating a specific emotional response (Frijda, 1993). Examples of positive states include happy, motivated, and active; examples of negative states include anxious, annoyed, and tired. Good internal consistency was found for negative ($\alpha = 0.70$) and positive ($\alpha = 0.79$) dimensions.

General Positive Well-Being

To draw comprehensive conclusions as to the effects of predictors on student well-being, it is necessary to also use a summative circumplex model of well-being (Feldman Barrett and Russell, 1998). This measures the second level of mood-based affect that is not directly anchored to an event and, therefore, at a different intensity to momentary affect (Brief and Weiss, 2002). General positive well-being was measured with World Health Organization (1998) 5-point Likert scale ranging from "strongly disagree" to "strongly agree." This scale helps to assess student mood-based affect for the past 2 weeks. A sample item is "I have felt cheerful and in good spirits and I have felt calm and relaxed." Good internal consistency was found ($\alpha = 0.84$).

Student Concerns

This scale was devised to assess participants' concerns about the impact of COVID-19 on the basis of seven items. The items were rated on a 5-point Likert scale ranging from "not at all stressed" to "extremely concerned." Varimax orthogonal rotation with Kaiser normalization was used for factor analysis extraction. All factors with eigenvalue >1, explaining 60% of the variance, were considered for further analysis. Coefficients smaller than 0.5 were excluded to get a reasonable number of factors with larger share of variance (Field, 2009). Adequacy of sample size measured by KMO and Bartlett's test of sphericity established a test score of 0.818 ($p < 0.001$). Communalities for variables taken for analysis were >0.5. Based on the dimension reduction technique, two latent variables were found to account for 77.38%, so the following two subscales were identified:

Concerns for degree completion measured the perceived effect of COVID-19 on student ability to complete their degree and meet academic expectation. The following four items comprised the subscale: "my exams and assessments," "my ability to

complete my course," "my final degree/course qualification grade," and "my grades." This subscale had a good internal consistency ($\alpha = 0.89$).

Concerns for future job prospects measured the perceived effect of COVID-19 on student ability to become employed upon graduation. These three items comprised the subscale: "my employability," "the wider economy," and "job prospects." This subscale had a good internal consistency ($\alpha = 0.86$).

Data Analysis

The Statistical Package for Social Sciences software version (26) with AMOS was used to analyze the data. Descriptive analysis was used to determine means, standard deviations, confidence intervals, skewness, and correlations among the six main variables (see **Table 2**).

Since the purpose of this study was to understand the antecedents of well-being, a path analysis was performed by employing structural equation modeling with maximum likelihood estimation method. The use of structural equation modeling in social science and education when testing mediation is recommended as it allows to test multiple pathways to assess the viability of the hypothesized model (Wu and Zumbo, 2007).

The study was exploratory; therefore, two types of university concerns served as independent variables: support from university as a mediating variable and general well-being together with either negative or positive in the moment well-being as the dependent variables. To determine model fit, we applied two types of fit indices: absolute fit measures (χ^2, RMSEA, AGFI) and incremental fit measures [NFI, NNFI (TLI), CFI; Hooper et al., 2008]. Chi-square (χ^2) in the range between 2.0 and 5.0 and the probability level with insignificant p-value ($p > 0.05$) were acceptable for threshold levels. The root mean square error of approximation (RMSEA) in the range of 0.03–0.08 provides a good fit. Values >0.95 were suitable for the adjusted goodness-of-fit statistic (AGFI), normed-fit index (NFI), Tucker-Lewis index in AMOS (TLI) or non-normed fit index in EQS (NNFI), and comparative fit index (CFI; Hooper et al., 2008).

RESULTS

First, path analysis was run to further evaluate the relationships between student concerns for degree completion and future job prospects, university support, general well-being, and negative in the moment well-being. Path analysis was also used to test the mediation model in terms of overall fit. The model shows satisfying results with the following model fit statistics: $p = 0.089$, $\chi^2 = 2.901$, RMSEA = 0.031, AGFI = 0.991, NFI = 0.999, NNFI (TLI) = 0.991, CFI = 0.999, and path coefficients presented in **Figure 1**.

Second, similar analysis was performed to explore the relationships between student concerns, university support, general well-being, and positive in the moment well-being. This model demonstrates the following statistics: $p = 0.055$, $\chi^2 =$

TABLE 2 | Descriptive statistics, correlations, and reliability coefficients.

Variables	M	SD	95% confidence interval for mean		Skewness	Cronbach's α coefficients	1	2	3	4	5
			Lower	Upper							
1. University support	3.64	1.01	3.60	3.69	−0.61	0.72					
2. General WB	2.83	0.95	2.79	2.87	0.19	0.84	0.340**				
3. Positive in the moment WB	2.76	0.74	2.73	2.80	0.42	0.79	0.313**	0.698**			
4. Negative in the moment WB	2.70	0.75	2.67	2.74	0.35	0.70	−0.268**	−0.565**	−0.513**		
5. Concerns for degree completion	3.18	1.15	3.13	3.23	−0.17	0.89	−0.346**	−0.504**	−0.463**	0.473**	
6. Concerns for future job prospects	3.08	1.24	3.02	3.13	−0.04	0.86	−0.057*	−0.260**	−0.208**	0.293**	0.407**

M, mean; SD, standard deviation; N = 1,932; WB, well-being; *p < 0.05, two-tailed; **p < 0.01, two-tailed. The numbers in the title row correspond to the numbers of variables in the first column.


FIGURE 1 | Path analysis with negative in the moment well-being.

FIGURE 2 | Path analysis with positive in the moment well-being.
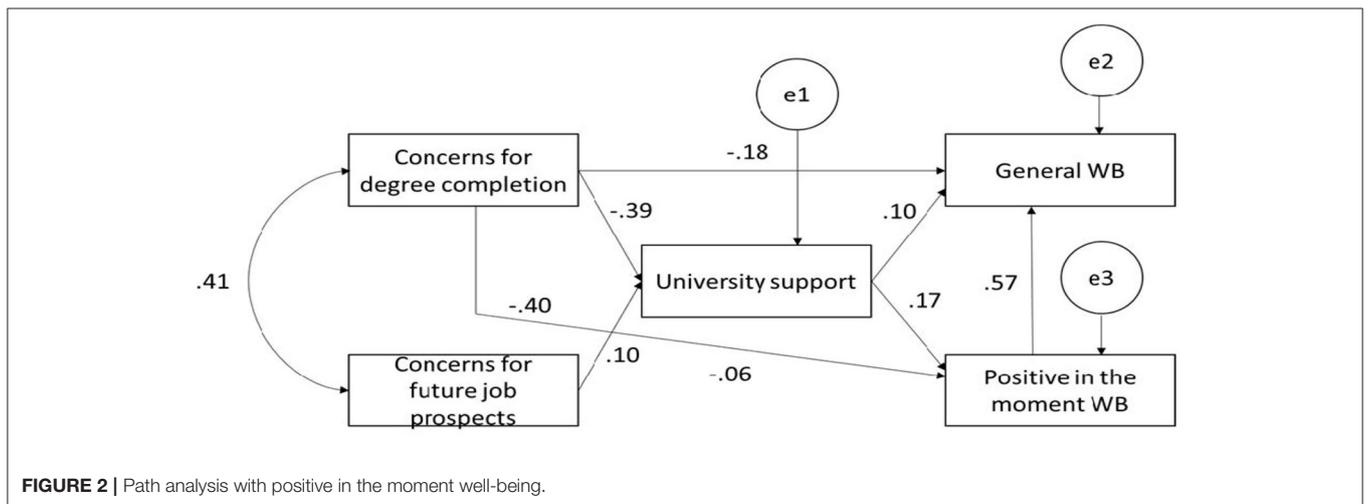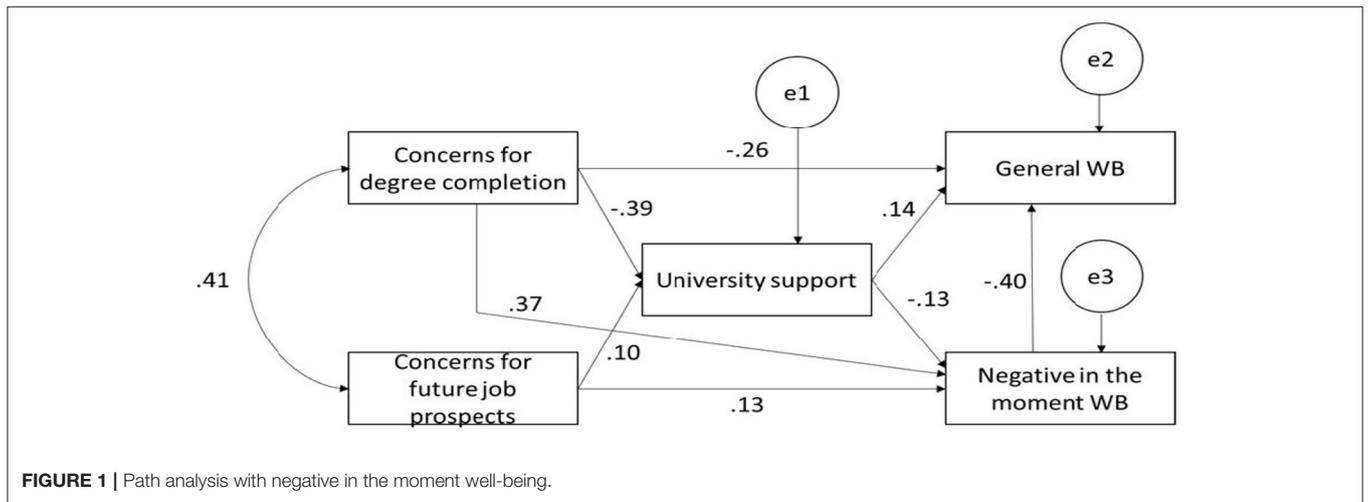
TABLE 3 | Direct, indirect, and total effects of student concerns on general well-being.

Paths	Coefficients for path analysis with negative in the moment WB	Coefficients for path analysis with positive in the moment WB
CDC→General WB	−0.264	−0.181
CDC→University support→General WB	−0.225	−0.306
Total	−0.490	−0.487
CFJP→General WB	–	−0.062
CFJP→University support→General WB	−0.034	0.02
Total	−0.034	−0.043

CDC, student concerns for degree completion; CFJP, student concerns for future job prospects; WB, well-being.

TABLE 4 | Direct, indirect, and total effects of student concerns on in the moment well-being.

Paths	Coefficients for path analysis with negative in the moment WB	Coefficients for path analysis with positive in the moment WB
CDC→in the moment WB	0.374	−0.403
CDC→University support→in the moment WB	0.051	−0.067
Total	0.424	−0.47
CFJP→in the moment WB	0.133	
CFJP→University support→in the moment WB	−0.013	0.017
Total	0.12	0.017

CDC, student concerns for degree completion; CFJP, student concerns for future job prospects; WB, well-being.

3.677, RMSEA = 0.037, AGFI = 0.989, NFI = 0.999, NNFI (TLI) = 0.990, CFI = 0.999 (see **Figure 2**).

All coefficients were significant beyond 0.05 level. The analyses of direct, indirect and total effects of student concerns on general well-being and both negative and positive in the moment well-being are shown in **Tables 3**, **4**, respectively.

The Perceived Impact of COVID-19 on Student Concerns for Degree Completion and Student Well-Being

The direct effect of student concerns for degree completion on general well-being and positive in the moment well-being is significant and negative (−0.18 and −0.40, respectively). However, when we consider negative in the moment well-being, concerns for degree completion had negative direct effect on general well-being (−0.26) and positive in the moment well-being (0.37). Moreover, the analysis of indirect effects demonstrates that university support mediates the effect of concerns for degree completion on general well-being (−0.31) and positive in the moment well-being (−0.07). In the same way, this construct influences negative in the moment well-being

affect (0.05) and general well-being (−0.23). These results suggest that the perceived impact of COVID-19 on concerns for degree completion has a significant negative effect on student well-being while university support plays a mediating role between these two variables, therefore fully supporting H1 and H3a.

The Perceived Impact of COVID-19 on Future Job Prospects and Student Well-Being

Concerns about the impact of COVID-19 on future job prospects have a direct effect on general well-being, which is significant and negative (−0.06), together with positive in the moment well-being and a significant positive effect on negative in the moment well-being (0.133). These results suggest that increased levels of concerns about the effect of COVID-19 on future job prospects leads to lower levels of general well-being and higher levels of negative in the moment well-being. Therefore, H2 is partially supported. Furthermore, university support attenuates the effect of concerns about future job prospects on negative in the moment well-being (−0.013) (**Table 4**). These results support H3b, thereby suggesting university support has a beneficial effect on student well-being.

Regarding the future job prospects, degree completion, and well-being, we ran the analysis of variation (ANOVA) to understand the differences between undergraduates ($n = 1,625$) and post-graduates ($n = 288$) separately. Post-graduates did not show any significant differences regarding degree completion [$F_{(1,286)} = 0.065$, $p = 0.798$], future job prospects [$F_{(1,286)} = 0.585$, $p = 0.445$], and general well-being [$F_{(1,286)} = 0.626$, $p = 0.430$]. However, significant differences between the undergraduate groups were observed for all three variables, namely, concerns for degree completion [$F_{(4,1,620)} = 7.77$, $p < 0.001$], future job prospects [$F_{(4,1,620)} = 30.2$, $p < 0.001$], and general well-being [$F_{(4,1,620)} = 4.99$, $p < 0.001$]. Then, a year-by-year comparison analysis was performed by applying Tukey's honestly significant difference test to examine how this is impacted by the year of study. As a result, first-year undergraduates (3.34 ± 1.09 min) expressed significantly higher levels of concerns for degree completion than third- (2.99 ± 1.17 min, $p < 0.001$) and fourth-year (2.98 ± 1.29 min, $p = 0.01$) students. Similarly, second-year undergraduates (3.34 ± 1.12 min) expressed significantly higher levels of concerns for degree completion than third- (2.99 ± 1.17 min, $p < 0.001$) and fourth-year (2.98 ± 1.29 min, $p = 0.01$) students. However, the findings were opposite when we compared the future job prospects means between years of study. The fourth-year students (3.76 ± 1.18 min) demonstrated higher significant concerns in comparison with other undergraduate groups, namely first-year (2.71 ± 1.12 min, $p < 0.001$), second-year (2.89 ± 1.25 min, $p < 0.001$), and even third-year (3.33 ± 1.26 min, $p = 0.007$) as well as those who study abroad or through placement programs (3.31 ± 1.15 min, $p = 0.016$). As for general well-being, the most optimistic group was undergraduates who participated in placement programs or studied abroad. These respondents expressed significantly higher levels regarding general well-being over the past week (3.09 ± 0.93 min)

than first-year (2.84 ± 0.92 min, $p = 0.039$) and second-year (2.72 ± 0.97 min, $p < 0.001$) students. However, there were no statistically significant differences between placement/study abroad undergraduates and third-year (2.85 ± 0.94 min, $p = 0.095$) and fourth-year (2.93 ± 0.92 min, $p = 0.641$) students.

DISCUSSION

The purpose of this study was to examine how student perceptions of their degree completion and future job prospects during the pandemic impact their well-being and what role university support plays in this relationship. We developed and tested the relationship between the perceived impact of COVID-19, university support, and student well-being. Our results showed that the perceived impact of COVID-19 on student concerns for degree completion negatively predicts levels of student well-being. In other words, the more worried students are about the impact of COVID-19 on their studies, the more their levels of well-being decrease. This result is in line with the findings of Poots and Cassidy (2020) who found support to be a positive predictor of well-being and a significantly negative relationship between academic stress and support. COVID-19 disrupted the balance point between the students' resource pool relevant to their academic pursuits and the numerous challenges they face (Dodge et al., 2012). Programs, processes, and services have gone online leading to student poor well-being. Therefore, the impact of the pandemic, and similar crises, extends beyond student perceptions of their success in their main role as students but also to their perceptions of happiness (Pollard and Lee, 2003), life satisfaction (Diener and Diener, 1996), and being intensely alive and authentic (Ryan and Deci, 2001).

Also, the results revealed that the relationship between the perceived impact of COVID-19 on student concerns for degree completion and levels of student well-being is mediated by university support. This result illustrates the importance of university support on student perceptions and emotional states, including stress, meaning making, and life satisfaction (Flinchbaugh et al., 2012). This university support represents a resource that is outside of individuals (Hobfoll et al., 2018). When this support is timely and adequate (Mokgele and Rothman, 2014; Wood et al., 2018), students can successfully deal with the demands of their educational pursuits. However, the study also indicates that when students perceive the negative impact of COVID-19 on their degree completion and well-being, they are less likely to perceive their university as supportive. We explain this situation with the different perceptions in effective support. Students and universities have differences in their views about which priorities support well-being (Graham et al., 2016). Students perceive university support as valuable and effective when they can obtain lecturers' timely feedback to their emails, transparent, and fast communication in relation to the changes from the COVID-19 situation, dynamic online courses, and emergency financial support amongst other factors. Students are becoming more exigent on the resources that universities could offer to support their academic success and how efficiently the support is delivered. From the university perspective, they need to develop solutions that are in line with institutional or governmental measures, but little concrete information exists. Universities may find it difficult to cope with changes related to COVID-19 immediately (e.g., adopt fully online learning environments whilst not all the lecturers have the capabilities or facilities to teach online). Therefore, students perceive that university support is not sufficient to their academic success while universities have already made great efforts to ensure online learning and working-from-home policies. Given that students' immediate priority is their academic performance, they are trying to gain more educational resources than universities may be able to offer. Students, therefore, may perceive their university support as insufficient to their degree completion. This could also be explained by one of the principles of the CoR theory that states that resource loss is disproportionately more prominent than resource gain (Hobfoll et al., 2018). Therefore, students seem to be very sensitive to a lack of or very little immediate and long-term university support to their academic success.

The study also found unexpected results related to the student perceptions of their future job prospects. First, there is no direct relationship between the perceived impact of COVID-19 on future job prospects and student well-being. In other words, student concerns about the impact of COVID-19 on their future job prospects does not decrease their level of well-being. This result needs further research. It is possible to suggest that students do not see an immediate threat because job prospects are about the future (Xu et al., 2015). For instance, students that are not in their final academic year could feel less of a threat of resource loss in terms of future employment. Instead, they are more stressed and concerned about the impact of the pandemic on their degree completion that is more urgent at the moment. Interestingly, students who are more stressed about the impact of COVID-19 on their future job prospects are more likely to perceive their university as giving higher levels of support. As fewer employment opportunities exist in the labor market, students expect university networks to offer them some potential job opportunities.

The study also showed that students at different levels of education perceived the impact of the pandemic in different ways. The most vulnerable group was undergraduates who expressed significantly higher levels of concerns for degree completion. Perhaps, due to the uncertainty related to the duration of lockdowns, social distance measures, and other restrictions as well as vaccine effectiveness and availability, first year students struggled to see how they are able to complete their program the most. They also have fewer life experiences to cope with different types of stress that appeared simultaneously. At the same time, last year students struggled the most with potential job prospects. This is somewhat expected because this group of students usually tries to find full-time jobs upon the degree completion. University management can mitigate these student concerns by introducing relevant practices based on the student study year.

Theoretical Implications

This study offers several contributions to better understand the mechanism of university support on student well-being during the COVID-19. First, our findings are in line with the prior

studies on the relationships between stress and well-being, and support and well-being. The research on the impact of COVID-19 on student concerns for degree completion and job prospects is underdeveloped. Therefore, by examining student resource loss, we have extended the application scope of the CoR theory and enriched COVID-19 related research.

Second, our findings highlight that students may not perceive university support in the same way when it is related to their concerns for degree completion or job prospects. Prior studies have acknowledged the positive relationship between university support and student well-being (Baik et al., 2019). Our findings imply that perceived effective support is context-specific. Under the impact of COVID-19, all students are concerned about their academic performance and are more exigent on university support. When students feel that they are not able to get support to achieve the balance between resource investment (e.g., spending more time to work online for group-based activities) and the challenge of continuing with their studies (e.g., receiving no immediate feedback when they have inquiries for lecturers or administrators), they may have a lower level of well-being (Dodge et al., 2012). To mitigate the risk to their well-being, students feel the need to deploy more time and energy to protect themselves against resource loss and recovery (Hobfoll et al., 2018).

Third, this study assessed negative in the moment well-being. Our results show that university support could mediate the relationship between impacts of COVID-19 (both on degree completion and job prospects) and student well-being. However, when students perceive a high level of support from the university, they feel a higher level of well-being and a lower level of negative in the moment well-being. This once again implies that university support plays an important mediating role in student perceptions of well-being.

Practical Implications

This study confirms the mediating role of university support that helps turning negative impact of COVID-19 into positive feelings of well-being. Universities could increase student well-being by giving support to student studies and their career and job prospects. This support should come from a wide range of university services that are responsible for all aspects of the student learning experience. For example, program faculty and directors should provide students sufficient and timely information about upcoming mandatory internships. Career centers should utilize their partnerships and networks in the local community to assist in finding their first job after graduation and/or internships. This support should include course instructors, program directors, university management and administration, digital and IT support, and supports from partnership universities for international exchange programs. Supervisors and administration should work closely with students conducting research projects related to their theses or dissertations. They should support them in setting the dissertation topic and research questions, data collection and data analysis, discussion of initiation findings, text drafting, and defending.

The study also suggests that a lack of questioning or concerns related to university support from students does not imply that students feel that they are receiving this support. This could indicate that students may feel forgotten, abandoned, or hopeless about receiving support from the university. Therefore, universities should ensure visibility and accessibility of support, which in the context of online learning would require integration and collaboration between academic and university support services (e.g., IT support, career centers, academic advising, and international exchange programs). They help students navigate the support systems and access all the resources they require to succeed academically and professionally. Universities should not only provide the resources needed for students to engage with online learning, but also propose training on different online pedagogies to course instructors, as these two points could ensure more a positive learning experience for students and their well-being outcome. In addition, universities should monitor the student well-being experience and provide relevant resources and interventions.

Also, with online learning, face-to-face social interactions are missing. Therefore, lecturers and administrative staff should concentrate more on relationship building. They should facilitate the online learning experience, adopt clear communication strategies, improve the learning tools (e.g., PowerPoint and recorded lectures) and diversify assessment methods (e.g., moving from traditional exams to video-based oral presentation and using applications to motivate students to engage in online discussions).

From the student perspective, universities should be aware of the students' changing emotional responses from positive to negative during the COVID-19 pandemic. Given that the impact of COVID-19 would probably induce more negative emotional states, universities should offer more support for emotional management. This should encourage students to talk about their concerns, worries, and anxiety toward COVID-19 and to help them destigmatize the fear of COVID-19 on their studies and future. This support should not be a one-time-event, but ongoing. With positive emotions, students are more capable to counterbalance the perceived negative impact of COVID-19 on their degree completion and job prospects by effectively using different resources to reduce resource loss.

Finally, it is important to note that staff well-being is essential in order to support this student learning experience. Therefore, whilst universities propose different support activities to promote student learning, academic performance, and future job opportunities, they should also put in place a variety of resources to support staff. Pedagogy training, digital support, online well-ness programs, high quality information related to Covid-19, peer learning, appreciation attitude, and positive thinking should be promoted. University support and well-being feeling of their staff are a must for their adjustment to this "new normal" work context and a better service to students. It should be acknowledged that although many of the recommendations in this section are best practice in non-crisis times, this research has shown that the current acute pandemic situation and its effect on students (and staff) requires a sustained and reliable response, which utilizes existing policies and procedures to their maximum potential.

Limitations and Future Research

The study used a cross-sectional design, so the results cannot illustrate the process and evolution of how the identified variables influence student well-being. Considering the nature of the COVID-19 crisis, it would be very useful to develop a longitudinal study. Given the subjective nature of perceptions of well-being, there is an opportunity to extend the research and give a deeper understanding of the students' experience by taking a qualitative study approach. For example, phenomenology could help researchers understand lived experiences of students (van Manen, 1990) during COVID-19. Phenomenology could also help to find out how students experience their well-being or how they "perceive it, describe it, feel about it, judge it, remember it, make sense of it and talk about it with others" (Patton, 2002, p. 104). Further studies could also explore potential variables that may be more likely to show differences in a cross-cultural context, for example, how various types of social support may be perceived differently in various cultural contexts. The study used self-reported data that could have created a certain bias, so future studies should consider using observations and document analysis to triangulate data.

The study found that there were no student concerns about the impact of COVID-19 on their future job prospects and this did not decrease their level of well-being. This result needs further research. For example, there may be some benefits of using a qualitative and cross-cultural approach such as diary methods. A longitudinal study could help tracking how student concerns for their future job prospects change. Many countries have overcome the second wave of COVID-19, but uncertainty about the economy and high unemployment rates remains. Similarly, it would be useful to understand how students address their concerns for their job prospects and employment and search for and obtain jobs.

CONCLUSION

The study showed the usefulness of the CoR theory in helping universities and students to understand the emotional responses and impacts on student well-being of the sudden and dramatic changes to the learning experience of an unexpected global crisis. It was found that a major crisis negatively impacts student well-being and their concerns about their studies. However, the longer-term concerns about job prospects and careers had no negative impact on well-being. Support was shown to be an important mediator in the overall impact on student well-being.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Hertfordshire SSAHEC with Delegated Authority. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

GP and KM were substantially involved in planning and conducting the study. NV, SN, and SR-T carried out the data analysis. MP, CJ, and DY wrote the article with contributions by NV, GP, SN, and KM. All authors revised the manuscript critically for important intellectual content, read, and approved the submitted version. All authors were involved in distribution of the survey.

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Learning Design for Future Higher Education – Insights From the Time of COVID-19

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The COVID-19 pandemic brought many challenges in higher education. All teaching and learning activities were moved online. Universities had to provide adapted solutions to facilitate learning and maintain students' engagement. Online education implies creating new learning environments with the help of digital technologies. Beyond the process of acquisition of knowledge, teachers needed to facilitate cooperative learning, build positive relations, and reduce negative emotions. We provide some expert insights based on empirical observations on teaching and assessment practices connected with psychology models applied in education. The aim of the paper is to formulate specific learning design recommendations for developing effective didactic strategies and addressing the current worldwide critical issue: dealing with digitization of higher education in the immediate future. We propose a model of university classes aimed at bringing together our experience as teachers of psychology and didactics with evidence-based cognitive-educational theories and practices. The result is an example of an instructional work-model based on the complex dynamic between cognitive, emotional-motivational, and social aspects of learning in online settings. The effectiveness of university teaching in the post-digital era is strongly connected with the ability to create cognitive-transferable learning experiences, emotionally safe learning environments, while promoting an active autonomy-focused approach for self-regulated learning.

Keywords: teaching and learning design, higher education, psychology-based instructional design, micro-course design, autonomy-focused teaching strategies, COVID-19

INTRODUCTION

Education is always affected by the context in which it is enacted. From local specificity to regional and global perspectives, 2020s COVID-19 pandemic profoundly impacted individuals and communities all over the world. Some trends in attitudes and behaviors which emerged in the last years became the new realities: a growth in the use of social media, more cultural and social gaps, a rise in anti-intellectualism in public life, changes in educational patterns, climate change, new labor market disparities, digitization etc. (Madalinska-Michalak et al., 2018).

COVID-19 pandemic has launched a digital revolution in higher education, bringing a lot of important changes in a very short time (Strielkowski and Wang, 2020). Digital tools appeared as a universal solution for education, ready to welcome cohorts of students and teachers.

Therefore, an interesting issue is how universities will respond to this ongoing change of beneficiaries' realities.

Helping students to develop the skills and attitudes they need to provide innovative responses to the changing world and the demands of their future employers became a strong requirement. The effectiveness of university teaching in the post-digital era is strongly connected with the ability to create cognitive-transferable learning experiences, emotionally safe learning environments, and promoting an autonomy-focused approach for self-regulated learning.

Engaged in the most recent context, this paper focuses on new insights into the challenges facing the academic environment since almost all teaching and learning activities were moved online. Since online education implies a different approach, related to creating new learning environments combining digital technologies and adapting the most recent findings in psychology, it is useful to ask what professional roles and core practices should be reconsidered? and how can university teachers facilitate cooperative learning, build positive relations, and an emotionally safe online learning environment? Building on the authors' personal insights, empirical observations, and practice, the present paper illustrates some examples of online teaching design activities responding to current tensions, changes and students' expectations, and emerging needs.

ADDRESSING THE PROBLEM: REDESIGNING TEACHING AND LEARNING IN HIGHER EDUCATION IN ONLINE SETTINGS

The challenges which the COVID-19 pandemic brought in academia triggered the need to find answers to many existing reflective and research questions concerning the specificity of online education. The following questions remain, and challenge educators who are interested in various types of evidence-based instructional solutions for online settings:

Which Aspects Should Be Considered While Designing an Online/Virtual Learning Environment?

Based on empirical research data published at the very beginning of computer-based learning, Nistor (2003) noticed the problems refer mainly to the social context of learning. Moreover, learners are often overwhelmed by the amount of information available in the learning context, by the unusual learning approach, which leads to inefficient processing of information and even to quit the learning process. To avoid these problems, additional support is necessary. But what should this support look like?

Learning designers should build online learning environments and courses which emphasize cognitive, emotional, motivational, and social aspects of learning. Evidence-based theories in psychology, such as (but not limited to) Cognitive Load Theory, Self-Determination Theory (Ryan and Deci, 2017), Knowledge Learning Framework (Koedinger et al., 2012), Cognitive Theory of Multimedia Learning (Mayer, 2019), Situativity Theory (Barab and Duffy, 2000), Value Theory of Achievement Emotion (Pekrun, 2000), Constructivist Theory (Airasian and Walsh, 1997), and Social Cognitive Theory of Learning (Bandura, 1997), should also be included. We argue the need for designing online courses that will increase the participation and wellbeing of students. Some key aspects derived from evidence-based theories mention above should be related to the learning activity is triggered by a problem that is relevant for the students; learning should take place in a social context; learning activities should include various active teaching and learning methods; the key attribute for the learner is motivation; there is a reciprocal relation between cognition and emotion when the learner is organizing and operates with information; and the instructional support in virtual environments is essential in self-regulation of learning. At this point, another critical issue arises are the university teachers sufficiently trained and committed to offer effective instructional support to students online?

What Is and What Is Not an Online Course? What Are the Criteria, If Any?

At the beginning of 2020, when teachers and students moved their collective efforts online, PowerPoint presentations first migrated as they were, from amphitheaters and laboratories, *via* screen-sharing in online meetings hosted by different platforms. The main problem is that PowerPoint slides on the Internet are pieces of information, not a course. An online course tends to be a complex, structured and rich learning environment, carefully developed by a team of highly qualified experts on the subject content, pedagogy, and ICT (Bjørke, 2017). Courses designed for online learning environments are advanced, well structured, and interactive. They are led or guided by a teacher or tutor (tutor-guided courses), giving advice, motivating, assisting groups, etc.

The *flipped classroom approach* mixing synchronous and asynchronous tasks and activities (Brame, 2013; Bjørke, 2017) grows into an interesting topic for university teachers during the recent active-learning webinars. Students access content and engage in activities designed to develop their understanding before class, and then, use the course time to discuss and engage in-depth with issues, ideas, and questions arising from the pre-course content and activities (Farmer, 2015). Using flipped learning in higher education enhances critical thinking skills, self-learning, experience building, and communication and collaboration skills among students (Mahasneh, 2020) but requires more attention to students' activity guidelines. Guided by less to more complex tasks, students autonomously perform the lower levels of cognitive work and focus on the higher forms of cognitive work, supported by their peers and by the professor. Virtual learning environments require understanding the learner's profiles and using cognitive, emotional, behavioral, and motivational information, to negotiate meaning and solve problems in collaborative and constructive ways (Bjørke, 2017).

How and When Students Are Learning the Critical Skills Associated With e-Learning?

Significant studies show that most students' information processing skills are haphazardly caught rather than specifically learned (Chappell, 2018). This phenomenon occurs even more frequently in online courses, even for students with strong e-learning skills (Chappell, 2018). Course content that requires multiple perspectives, and controversial issues are useful for creating one of these activities. Chappell (2018) also presents a few steps for designing critical information processing activities: (1) the theory or concept used; (2) the teacher should provide digital resources to show multiple angles, perspectives, or ideas; (3) the teacher and students should ask simple questions that require analysis, research, and evaluation to answer; and (4) the teacher should consider that critical information processing skills are best taught rather than caught.

What Are the Elements That Can Make (Blended and) Online Learning Successful?

Blended and online courses redefine traditional educational roles and provide different opportunities for learning. According to Smith and Brame (2013), there are some critical aspects of effective online education. Firstly, acknowledging what students bring to the online classroom (background, needs, and interests) and what they take away as relevant and meaningful outcomes is essential. Secondly, including collaborative discussions and small group assignments creates a "level playing field" for disadvantaged students. Thirdly, it is important that students understand which behaviors help them learn and proactively apply those strategies. This awareness and knowledge of one's personal learning process involve increased metacognition – a key practice for students' self-regulated learning. Fourthly, by self-monitoring their time and pacing, students can control their learning and are able to spend more time on unfamiliar or difficult content. Fifthly, the immediate feedback provided in multiple manners in online settings is a very useful aspect of online learning. It is easier for learners to contact instructors or peers *via* email/learning platform/chat. In addition, online tests and quizzes can be constructed with automatic grading capability that provides timely feedback (Smith and Brame, 2013). Last but not least, using multimodal materials can be used to increase engagement, autonomy, and self-regulation.

## GUIDELINES FOR COURSE DESIGN IN ONLINE SETTINGS

Our proposed instructional work-model is taking into consideration both internal factors (cognitive processes) and external contextual variables and the reciprocal relation between them, promoting a co-constructive process of meaning and facilitating higher-order learning outcomes (Mayer, 2019). Moreover, our approach in proposing the current guidance instruction model is based on the urgent need for flexible online learning courses, adapted and personalized to cognitive,

emotional, motivational, and social needs (Redding, 2014). Enhancing students wellbeing and satisfaction related to learning should be a priority goal for higher-education professionals in a post-pandemic world.

Bringing together the theoretical and methodological assertions presented in the previous sections, we propose a general frame for designing active online/blended courses, with four stages (adapted from Quinn et al., 2014; Windschitl et al., 2018, 2020). They are different facets of effective practice that can be connected for promoting successful teaching actions (**Figure 1**):

1. *Identifying the main ideas and planning engagement with science information and skills to be achieved* – it requires the teacher to select the relevant ideas for the students in constructing new knowledge or skills. The course must connect individual learning experiences and interconnected understandings.
2. *Eliciting students' ideas and adapting instruction* – teacher figure out the resources students bring to the topic (possible, flipped classroom approach). Sensemaking discourse of students is essential in this state. The teacher is scaffolding the dialogue by sharing the main ideas. Explicit thinking allows students to learn through modeling.
3. *Supporting ongoing changes in students' thinking* – it involves cycles of learning activities based on learning support materials and interactive direct (synchronous) instruction. Group/pair activities, the group's ideas presentation is recommended. Students learn to organize various resources for solving problems and developing new knowledge. Peer/group presentations also support the development of students' academic discourse.
4. *Depiction together with evidence-based explanations. What is in here for my growth?* – proceed toward new ideas (to step 1) – supports students in using ideas from the previous activities to revise their current explanations and scientific models. Students (individual and pairs) are asked to make final versions of their hypothesis, explanations, summaries, and to examine records of their thinking from earlier in the course/laboratory. This step reveals the depth and generalizability of what student has learned. At the same time, provides feedback to the teacher about the efficacy of instruction, including tools and routines that need to be modified.

Taking the case of science teaching and learning course (pre-service teacher education, fourth semester), we create the opportunity for knowledge to be constructed by the students, using a problem-based learning approach, which was previously associated with greater relatedness, autonomy, and control, but also with an increase of intrinsic motivation (Wijnen et al., 2018), reduced students stress (Moffat et al., 2004), retention of information, and critical thinking skills (Schwartz et al., 2001). The activity is online managed using a platform that features the option of breakout rooms/channels (e.g., Microsoft Teams, Zoom, and Google Meet). The teaching and learning strategies include cooperative learning design adapted for higher
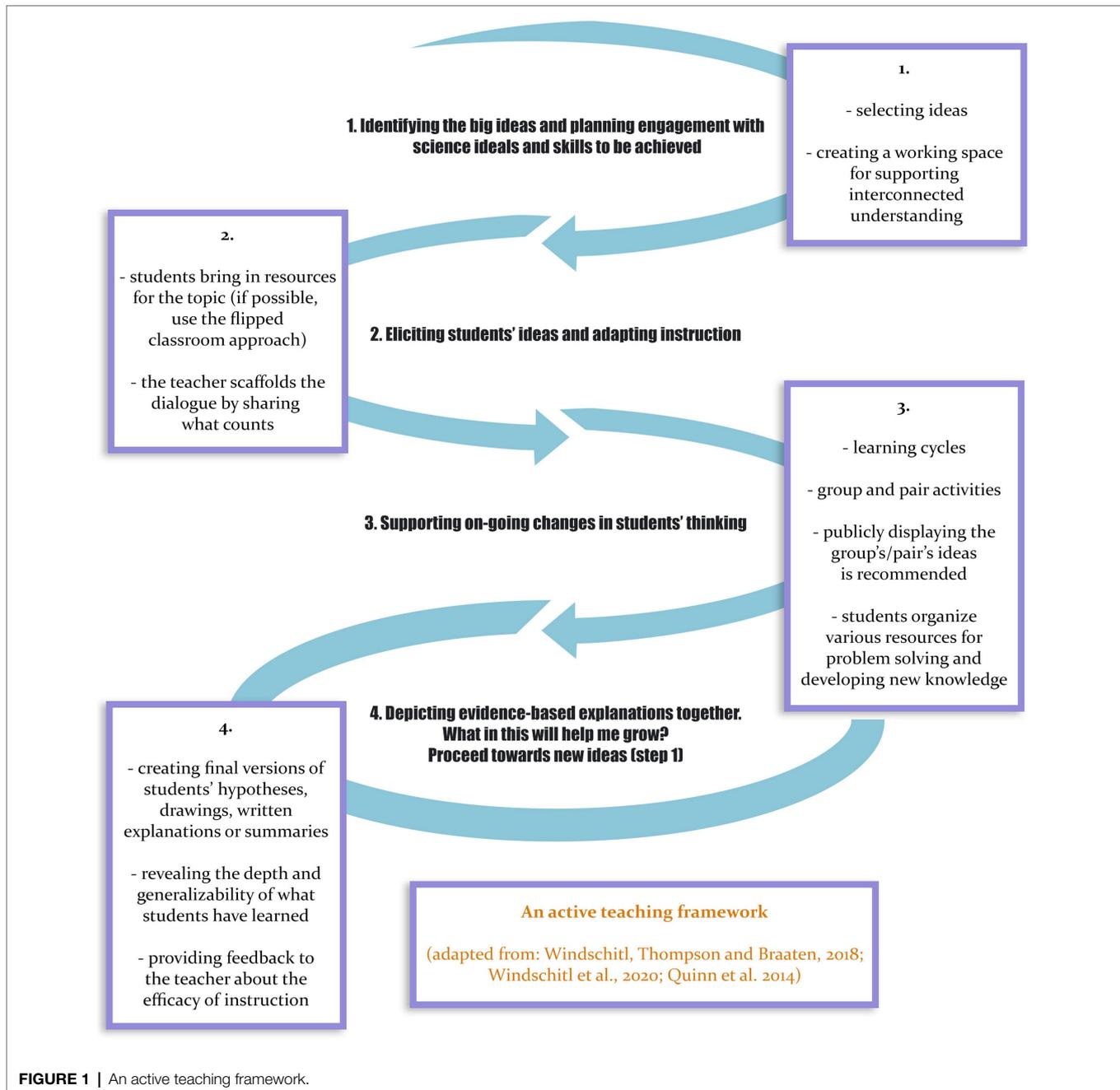
FIGURE 1 | An active teaching framework.

education (Ertl and Stegmann, 1999), the ground rules of the flipped classroom (Farmer, 2015; Mahasneh, 2020), and project-based learning (do Amaral et al., 2015; Ulrich, 2016) which are evaluated through different tasks, assignments, time, and material management (implementation of general frame stages 1, 2, 3, and 4 mentioned above). The professor may provide students with guidelines for Socio-Scientific Inquiry-Based Learning (Amos et al., 2020); successful promotion of engaged learning is particularly reported when the inquiry questions involving local and personal relevance (implementation of general frame stages 3 and 4 mentioned above). The key problem presented to the students is to produce a learning

environment needed for teaching biology lessons online as well. We divided the problem into sub-tasks: (1) acquiring information on the Internet and evaluating learning materials and online learning environments; (2) strategic processing of information and preparing materials for teaching specific biology lessons. Scientific content selection is, by choice, from the Biology National Curriculum for the secondary or high school levels (mainly related to the general frame stages 2, 3, and 4).

During the problem-based assignment, students need to be active, to work together, build a biology lesson, a methodological frame, an online-appropriate environment for

this lesson, and then to present the "product" to the other groups (mainly related to the general frame stages 2 and 4).

The whole course includes lesson presentations (micro-teaching, role play, and mentoring), but nevertheless, it is designed on-site or online (mainly related to the general frame stages 3 and 4). Even if the content – teaching biology in an online environment – is pre-specified, each group can decide which aspect of the subject they want to work on and which resources they want to use. Also, students can decide when to work together or alone, dividing the task and which kind of activity fits their learning style (Ertl and Stegmann, 1999). There is a meeting/lesson/course every week and a deadline for every task, but there is also a time for incubating ideas and personalizing the learning process and outcomes (mainly related to the general frame stages 2 and 4). The tools students use and the current problems they deal with are strongly connected to their professional field. Also, students learn multiple perspectives of the same subject and need to build valuable and useful support resources (implementation of general frame stages 3 and 4 mentioned above, with a cycle perspective, returning to phases 1 and 2). This example demonstrates that learning – even in online settings – could be planned as an active, constructive, emotionally safe, and self-regulated process in which students autonomously create new knowledge structures and link them with the existing ones.

DISCUSSIONS

The integrated work-model, we designed as an example of online learning method is based on the complex dynamic and constant interaction between cognitive, emotional-motivational, and social aspects of learning, which are responsible for academic performance, especially in online settings and pandemic stressful context (Hendrie and Bastacini, 2020). We do not seek to propose an exhaustive and extensive model of instructional design but to offer a guideline for higher-education professionals for structuring and adapting their own courses to student's needs. The main purpose of our article was to open reflective questions and perspectives for paying more attention to learning specificity and translating active instructional methods into e-methods and contents validated by psychological models and frameworks.

More specific, the **cognitive** aspect of learning is represented in our model by emphasizing the processes of reflective thinking, associations, and sensemaking, which is in line with the previous instructional strategies derived from the Knowledge Learning Framework theory (Koedinger et al., 2012). Moreover, the Cognitive Theory of Multimedia Learning states the importance of engaging students in appropriate active processing through selecting the relevant information, organizing, and integrating it, due to its value for promoting meaningful learning and long-term retention. At the same time, active learning in academic tasks increases in-depth learning, proved to be essential for generalization and information transfer,

which is strongly related to our proposed work-model (Mayer, 2019).

Motivational aspects of learning are critical to learning environments which require a high level of engagement (Fiorella and Mayer, 2015; Buhr et al., 2019). Through the activities we proposed in our instructional design model, we paid greater attention to the self-efficacy cognitions (Bandura, 1997) and the three psychological needs, derived from Self Determination Theory – autonomy, control, and relatedness (Ryan and Deci, 2017). Recent research showed the significant positive effect of online courses meeting those needs on student's psychological engagement in online learning (Huang and Mayer, 2016; Sun et al., 2019). More, a flipped classroom approach and an educational environment rich in resources for learning, positive relations, feedback, and learning goals, were proved to offer opportunities for accomplishing students psychological needs (Muir, 2020). The active roles and responsibilities of students, helps them feel connected and cognitively engaged and increase self-efficacy, which can lead to better engagement and performance in learning tasks (Bandura, 1997). Allowing students to manage and moderate their discussion in small groups increase self-efficacy, and autonomy. Mayer (2019) argues in favor of designing learning activities that provide opportunities for engaging reflection and collaboration, which is also the case of our example.

Another important dimension of learning is the **emotional** one. Promoting students' positive and healthy emotions were essential when proposing the course design guidance. Previous studies showed that engaging in real-life problem-based activities, cultivating relations through learning, and feedback significantly improved students' enjoyment and satisfaction in the online environment (Guo et al., 2018). The collaborative and active approach may also reduce anxiety, increasing student's wellbeing, and reducing emotional distress (Mayer, 2019).

Last, but not least, the **social** component of learning is essential for increasing learning effectivity through human connection. From a Situativity theory (Barab and Duffy, 2000), meaningful learning is being socially constructed. A strong argument for instructional methods based on collaboration, human connection, and reflection is that it increases meaningful learning outcomes. In our model, those aspects are enhanced by working collaboratively, feedback, guidance, and modeling, which are also conditions for critical thinking and self-directed learning competencies (Mayer, 2019).

The main limitation of our proposed work-model is that it is not empirically validated; it is rather based on translating some evidence-based principles into practice, together with professional reflections and experiences. Second, even if we managed to integrate into our model all the relevant dimensions of learning and to relate them with the previous results in the field, there are still other contextual and individual factors that can interfere with the effectiveness of the instructional design. Third, a possible limitation can be related to the teacher and students' technical skills and access to technology. Future studies should empirically address these issues.

The most important implication of our work is related to building more effective course designs in higher education, which will promote highly autonomous learners and increase student's self-regulation and self-management skills in online settings (Wong et al., 2019). Our paper seeks to emphasize the crucial role of teacher's insights and practices, in constructing adapted and individualized classes, especially in an online educational environment. We promote the active teaching strategies for online classes in order to highlight the positive implications of applying psychology-based instructional design principles to course design.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, and further inquiries can be directed to the corresponding authors.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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COVID-19 Impacts on Teaching and Learning: A Collaborative Autoethnography by Two Higher Education Lecturers

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The phenomenon of the Covid-19 lockdown in New Zealand during 2020 enabled two Higher Education (HE) lecturers to reflect on grappling with new technologies, changes in lifestyle and livelihoods, and the impact that social isolation had on Bachelor of Sport and Recreation (BSR) students as they shifted to emergency "remote" teaching and learning. This paper presents personal narratives, authored collaboratively by lecturers Anna and Hana (pseudonyms), engaging with a socio-ecological systems framework. The systems framework presents a layered, multi-faceted approach to reveal the complexity of the impacts of Covid-19 on HE teaching and learning. In-depth analysis of the microsystems, mesosystems, and macrosystems making up their systems framework, serve to highlight specifically how Anna and Hana interpreted their own and their university students' responses to the unprecedented measures imposed on their lifestyle (home), livelihood (employment), and HE experience (online learning). By applying an autoethnographic methodology, this paper acknowledges and celebrates the lecturers' subjectivity, emotionality, and influence on the presented research. As educators, their critical self-reflections are authentic and timely, expressing key concerns and considerations, while searching for optimal solutions to deliver equal and equitable learning opportunities for all students. A unique characteristic of this phenomenon was the inability (due to COVID-19 restrictions) of students who learn through practical contexts, to enact kinesthetically in a meaningful manner, and the subsequent implications on their learning. This paper presents a snippet of the lecturers' reflective practice, co-constructed from recollections, memories, and anecdotal evidence, against a backdrop of current Covid-19 research on the effects of the pandemic, on teaching and learning globally. Whilst this paper sheds light on the experiences of two HE lecturers during the COVID-19 lockdown, a collection and analysis of "student" voice, is recommended. This paper concludes that a collaborative autoethnographic approach during exceptional circumstances, such as natural disasters, pandemics, and other disruptive situations, provides an opportunity for professional self-observation and self-reflective practice that is mutually beneficial, and empowering. These insights provide shared critical knowledge to sustain achievement while averting negative impacts, for students and lecturers alike.

Keywords: autoethnography, COVID-19, self-reflection, teaching and learning, technology, socio-ecological, wellbeing, lockdown

INTRODUCTION

The Covid-19 pandemic brought extraordinary disruption to Higher Education (HE) institutions, locally and globally. In New Zealand, the Coronavirus pandemic struck in full force during March 2020, affecting the day-to-day delivery of programmes of study, in a manner not previously witnessed since World War I and II. The necessity to impose carte blanche restrictions on every individual's access and connection with their educational programmes, at all levels, was uncompromising. Justification for these severe measures, as cited by New Zealand's Prime Minister, included limiting travel, advice on mass gatherings, and guidelines for student attendance and deferment. By March 25, 2020, full lockdown (except for essential workers) was enforced with campuses closing seemingly overnight (Ministry of Education, 2020a). Students were forced to remain within their home bubble (immediate family) and to prepare for online learning. When venturing out for the recommended 1-h of exercise per day, wearing a face mask and social distancing were mandatory.

Educational establishments were closed for on-campus activity, and lecturers were advised to provide "blended and online learning opportunities", and to implement track and trace options, social distancing, and high levels of hygiene. In the context of the Bachelor of Sport and Recreation (BSR) within an Auckland university, these restrictions forced all lectures to be delivered online, principally through the university's online learning management system (Blackboard) and two intranet platforms: Panopto and Collaborate. This unexpected shift to remote teaching was complicated by the fact that "emergency remote teaching" in response to a crisis bears little resemblance to deliberately designed online teaching and learning (Scherman, 2020).

In New Zealand, government consultation with the ministries of Health and Education shaped the parameters of the level 4 lockdown. Recommendations from the Ministries of Health (2020a, 2020b) and Education (2020b) were formulated in line with overseas countries experiencing similar coronavirus community transmission. While the number of infectious cases in New Zealand was small with less than 1,500, the decision to "go hard and to go fast" (Prime Minister's Covid-19 daily announcement, March 23, 2020) had unexpected and unprecedented impacts on teaching and learning at all levels of the education sector (Ministry of Education, 2020c; Ministry of Education, 2020d).

We adopt a collaborative autoethnographic approach to enable critical reflection on the experiences of teaching in higher education. Autoethnography enables the researcher to reflect on their personal experience through self-reflection. In addition, a collaborative autoethnographic approach ensures reflexivity (Delamont, 2009). The process of reflexivity occurred through each lecturer reading the other lecturer's accounts of their experience and commenting on suitability for inclusion. Thematic analysis was undertaken through this familiarization (Braun and Clarke, 2006). The socio-ecological literature (Bronfenbrenner 1979; Voydanoff, 2007; Pocock et al., 2012) provided opportunity for the authors to triangulate data

with their conceptual understanding of their, and others' experiences, in the higher education environment (Wilson et al., 2020). Deep, critical, self-reflective practice at this time, enabled increased compassion with the wider community that both the lecturers and their students were exposed to during Covid-19 lockdowns.

This article proposes a conceptual framework (**Figures 1**, **2**) to help make sense of grappling with new technologies, changes in lifestyle and livelihoods, and the impact that social isolation and increased workload had on two Higher Education lecturers as they shifted to emergency "remote" teaching and learning.

The article falls into seven sections. In the first, we discuss the significance of Anna and Hana's self-reflective practice against international literature that addresses the impacts of the Covid-19 pandemic on global education. For example, studies situated in Canada, United Kingdom, India, and China provide diverse perspectives while revealing commonalities of challenge and opportunity during the forced move to online learning. In the second, we briefly review the current empirical research on the impacts of new technologies on teaching and learning in higher education settings. In the third section, we outline a conceptual approach to lecturer higher education experiences, lifestyle (home) and livelihood (employment) (**Figure 1**). Our central goal is not to make an empirical contribution but to provide insights and recommendations regarding the plight HE lecturers face, and it is assumed many other educators face, when seeking to optimize remote online learning while themselves, concurrently are learning new technologies and IT systems. In the fourth, we consider a modification of the conceptual framework to best fit the exceptional circumstances generated by the Covid-19 pandemic. In the fifth, we set out the demands and resources (**Figure 2**) that arise in each of the domains of higher education experience (new technologies, remote online teaching, and learning), lifestyle (home bubble, work-home balance), and livelihood (employment, workload), on lecturer wellbeing. In the sixth we argue that the four factors of time, space, power, and life stage are important elements of a "socio-ecological system". Section seven considers the socio-political factors influencing demands, resources, and wellbeing during a global pandemic. We conclude our article by summarizing our key concerns and considerations. Throughout the article, we draw on self-observation, self-reflection, memories, and anecdotal evidence to argue for a stronger analytical framework to improve understanding about the relationship between higher education experiences, lifestyle, and livelihood, and how they relate, interrelate, connect, interconnect, and intersect within a "socio-ecological" framework, during unprecedented circumstances. We note that future research on student lifestyle, livelihood and HE experience during pandemic times would further enhance teaching and learning pedagogical practice in HE institutions.

IMPACTS OF COVID-19 PANDEMIC ON GLOBAL EDUCATION

Lockdown and social distancing measures due to the COVID-19 pandemic have led to closures of schools, training institutions and

higher education facilities in most countries (Pokhrel and Chhetri, 2021). Education systems and educators have been forced to adopt "Emergency Education", transitioning from traditional face-to-face learning pedagogies to remote virtual platforms, despite the challenges posed to both educators and the learners. This forced remote teaching and learning, viewed by Dhawan (2020) as paving the way for introducing digital learning, represents a paradigm shift in the way educators deliver quality education. Challenges inherent in sudden, reactive rather than anticipated and planned e-learning responses to a global pandemic, include accessibility, affordability, flexibility, learning pedagogy, life-long learning, and educational policy (Murgatrotd, 2020). While many countries have substantial issues with a reliable internet connection, others report an inability to afford online learning devices, sufficient physical workspace, or a lack of parental guidance (more so for younger learners). Petrie (2020) identified that the best practices for online home schooling are yet to be explored, and that many students learning at home had undergone psychological and emotional distress and were unable to engage in online learning productively.

Another challenge identified by recent publications on the impacts of Covid-19 on teaching and learning globally, include providing comparable assessments and examination conditions to the pre-Covid-19 face-to-face provision. Research by Sintema (2020) reported that reduced contact hours for learners and a lack of consultation with teachers when facing difficulties in learning/understanding, resulted in lowered performance on year-end examinations and internal assessment outcomes. Online student assessments were documented as requiring a lot of trial and error, with uncertainty and confusion occurring among the teachers, parents, and students. It was found that appropriate measures to check plagiarism was yet to be put in place in many schools and institutions, mainly due to the large student populations involved. The lockdown of schools and universities has not only affected internal assessments and examinations for the main public qualifications like General Certificate of Secondary Educations (GCSE), but A levels have also been cancelled for the entire cohort in the United Kingdom. The United Nations (2020) anticipated that a postponement or complete cancellation of the entire examination system was possible, depending on the duration of the Covid-19 lockdowns, globally. For example, due to the Covid-19 outbreak and national lockdown in India, various entrance-level examinations (such as BITSAT 2020, NATA 2020, CLAT 2020, MAT 2020, ATMA 2020) were postponed/rescheduled (Pokhrel and Chhetri, 2021).

Current literature indicates there are economic, social, and psychological repercussions on the life of students while they are away from their normal schedule of study (Pokhrel and Chhetri, 2021). Increased and unstructured time spent on online learning platforms exposes children, adolescents, and young adults to potentially harmful and violent content as well as greater risk of cyberbullying. School closures and strict containment measures mean more families have been relying on technology and digital solutions to stay engaged in learning, be entertained, and remain connected to the outside world. Substantial increases

of time spent on virtual platforms is reported to impact on domestic violence and child abuse as the perpetrators are often at home or in the neighborhood, which is a mental distraction and threat to the learners (Ravichandran and Shah, 2020).

From a positive perspective, the COVID-19 pandemic has forced governments and educational policy makers, at all levels of education, to take immediate action to optimize implementing e-learning systems during the Covid-19 global pandemic. This urgency has forged a strong connection between educators and their communities, especially with parents who have, without any training, become educators *in situ*. The use of online platforms such as Google Classroom, Zoom, virtual learning environment and social media and various group forums are being explored and tried for teaching and learning, to continue education through digital platforms. The impacts of Covid-19 on HE teaching and learning in 2020 precipitated educators (locally and globally) to develop creative initiatives to overcome the limitations of virtual teaching. For example, lecturers needed to actively collaborate with one another at an institutional level to improve online teaching methods. There were and still are incomparable opportunities for cooperation, creative solutions, and a willingness to learn from others by trying new tools as educators, parents and students sharing similar experiences (Doucet et al., 2020). While online learning has provided the opportunity to teach and learn in innovative ways, many inequities have emerged from this forced shift to remote teaching and learning. As of July 2020, 98.6% of learners worldwide were affected by the pandemic, representing 1.725 billion children and youth, from pre-primary to higher education, in 200 countries (United Nations, 2020). Therefore, making learning possible and available from home schooling has been the need of the hour at all levels of teaching and learning.

Current Research on the Impact of New Technologies on Learning

Integral to this research is an examination of the theoretical perspective upon which the article was based: a socio-ecological perspective. The implications of being a university lecturer whilst living through the overarching impacts of the Covid-19 lockdown were that "normal" face-to-face teaching and learning was speedily replaced with remote online teaching, and a new way of engaging with the university's Information and Communication Technology (ICT) systems. A body of empirical work now exists on the relationships between new technologies and teaching and learning (for recent edited volumes see OECD's Programme for International Student Assessment (PISA) surveys, 2000, 2003, 2006); Pew Research Centre, 2011; SMART Technologies International Society for Technology in Education (ISTE), n.d.). This body of knowledge is not new to pandemic times. Much of the existing work has recognised strengths; it frequently applies multidisciplinary perspectives, multiple methods, and a cross-national perspective which we would expect to take up in lockdown times (Kong and Song, 2014; Zimlich, 2015; Bhakta and Dutta, 2016). Some studies draw attention to the role of the

government, social norms, and future directions (Buckenmeyer, 2010; DeCoito and Richardson, 2018; Raja and Nagasubramani, 2018). There is considerable agreement on some issues: for example, the positive effects of digital devices to enhance and motivate learning for more able students, increased opportunity for self-directed and independent teacher and student learning, flexibility of learning 'times', and the need for effective teaching resource development and implementation. What is not so evident is a consideration of less able and/or less advantaged (culturally, socio-economically, politically) students. There is considerable agreement about the size and direction of effects: that both online learning to lifestyle (home bubble) and online learning to livelihood (employment) spill over exists, with either positive or negative impacts. However, positive online learning to lifestyle is more common and significant than negative online learning to livelihood interactions. Other considerations of note are the timeframe within which new technologies are designed and implemented, the competency and confidence of the educator in utilizing new technologies, and the changing role of the educator in the learning process. Impacts on teacher wellbeing are also highlighted by recent research (Badia et al., 2013; Ruggiero and Mong, 2015).

Studies identify two forms of concern when implementing new technologies within a learning environment: 1) Information overload for educators and students due to the speed of access and volume of material available through digital platforms, such as the internet (via the world wide web), social media sites, and other forms of software programs (both educational and recreational), and 2) Increased workload due to: 24-h connectivity, reduced capacity for educator strategic technology planning (knowledge content, assessment, results and review), appropriate integration of technology in teaching and learning, professional development (to keep up with current innovations), and technology infrastructure management (the utilization of e-platforms from an organisation and educational sector perspective) (for summaries of recent findings, see Pew Research Centre, 2011; Raja and Nagasubramani, 2018).

Existing research shows the benefits of new technologies on learning are most pronounced when ICT facilitates the sharing of resources, expertise, and advice, when it provides greater flexibility for educators to carry out different kinds of task at different times, and promotes educators' skills, confidence and enthusiasm when navigating changes in teaching and learning techniques, for example from face-to-face to online learning (Bhakta and Dutta, 2016). The same research indicates that increased use of technology can severally affect the thinking ability of students, reduce the face-to-face interaction between educator and student that provides a more personal experience, and result in a lack of interest in learning as everything is accessible through data saved in a computer or on mobile devices.

We know which factors can make a difference to the successful transition from face-to-face to online learning, without detrimental impacts occurring for educator and student lifestyles and livelihoods. By using modern technological devices educators can expand their knowledge and develop their professional teaching skills. However, this in itself is a learning process which requires time, expertise, resources, and motivation.

While the study of the impact of new technologies on learning has been undertaken in several countries in the past 10 years, a forced shift to online learning during exceptional circumstances such as natural disasters, pandemics, and other disruptive situations, has not previously been documented prior to the Covid-19 global pandemic. First, much of the existing research is based in first-world centric countries such as the United Kingdom, Canada, Australia, and the United States with relatively little research occurring outside these areas (OECD, 2007). During the 2020 Covid-19 global pandemic, over 100 countries (BBC News, 2020) experienced 'lockdown' to reduce community transmission of the coronavirus. This article aims to provide insights from the professional self-observation and self-reflective practice of two HE lecturers in New Zealand, to inform future institution-based policy and procedures, locally and farther afield.

Second, the existing body of work provides a balance between positive and negative impacts but within the context of a 'normal' teaching and learning context. The current global pandemic has forced many countries into rapid online learning, with educators and students being displaced from their usual place of 'work', working, or studying from home, learning new digital platforms and systems within short timeframes, while institutions and educators have endeavored to provide pastoral care for their learners, from a distance. This scenario is unprecedented. It was unexpected and had the potential to cause major disruption and disconnection for the teaching and learning process, world-wide.

Third, there is substantial research on the impact of new technologies on student learning and wellbeing within a classroom (Courduff, 2011; Lin and Yang, 2011; Miller, 2011; Costley, 2014), and student learning and wellbeing outside the classroom (Meier et al., 2016; Lissack, 2018; Dienlin and Johannes, 2020), but less so on the relationship between new technologies, online learning, and wellbeing (Pew Research Centre, 2015; Halupa, 2016). A rapid shift to online learning is a new phenomenon which bears little resemblance to deliberately designed online teaching and learning (Scherman, 2020). The extraordinary situation of working or studying remotely from home (within a lifestyle bubble) requires multiple adaptions, reorganizations, and physical space. Access to electronic hardware and software (livelihood), and some semblance of 'normal' (wellbeing) are essential to provide reassurance and direction, for students and lecturers alike. The sense of disconnectedness from and loss of a 'regular' daily routine was sudden and disturbing, with mental ill-health negatively impacted for many.

This article is positioned to address, through the collaborative autoethnographies of two lecturers, the intersection of the three domains of HE experiences, lifestyle, and livelihood (**Figure 1**) as portrayed by the self-reflective practice of Anna and Hana. These insights provide critical knowledge when reflecting on HE teaching and learning contexts.

Conceptualizing Higher Education Experience, Lifestyle, and Livelihood

Research about educators' experiences is usually undertaken to highlight best practice to support and develop educational outcomes (Paavizhi and Saravanakumar, 2019). Consideration of the impacts of the educator's lifestyle (home) and livelihood (employment) on their experience as an educator, are scarce. Much existing research has been undertaken on teaching and learning with only brief reference to the spillover effect on an educator's lifestyle and livelihood. This section aims to conceptualize the three domains of HE experiences, lifestyle, and livelihood (microsystems), to clarify and highlight the significance of the intersections, interrelatedness, interdependence, and interactions across, within and between each domain (mesosystems). This conceptual framework (**Figure 1**) also represents wider external influences (macrosystems) acting on the educator's system, such as, societal norms, national and international economic, political, and social drivers (decisions and responses made to manage local and global conditions), and historical traditions relating to education.

In the context of this article, the microsystems in Voydanoff's adaption of Bronfenbrenner's Socio-Ecological Model (SEM) (**Figure 1**) represent influences of proximity to the central individual (educator): regarding their higher education experiences (on campus teaching, colleagues, managers, administrators, resources, assessment and reporting deadlines, reviews, planning, etc.), livelihood (physical workplace, tasks and conditions, hours per day, remuneration, outputs, career pathway), and lifestyle (family, extended family, friends, neighborhood, hobbies and interests, leisure, use of leave). It is the most influential level of ecological systems theory.

Beyond this, a mesosystem of intersecting domains exists, surrounded by an exosystem: that is, the external environment which affects the individual but in which they do not personally participate, such as, top-down decision making, policies and procedures (Pocock et al., 2012). Finally, these are located within a larger "macrosystem" which comprises overarching cultures, institutions, and broad belief systems (Bronfenbrenner, 1979).

The mesosystem, consisting of different parts of the microsystem or interactions between different parts of a person's microsystems, has a direct impact on the individual which can be influenced either positively or negatively. The macrosystem involves the links between a social setting in which the individual does not have an active role and the individual's immediate context (Bronfenbrenner, 1979). For example, an individual being restricted to stay within their "home bubble" due to the Covid-19 lockdown, and not venturing out except for essential supplies or for the permitted 1 h of exercise per day. The larger macrosystem also encompasses an environment which includes the economy, culture, and politics, and describes the overall societal culture that an individual lives in. These overarching cultures, institutions, and broad belief systems, impact on the individual indirectly but may be experienced through policy changes, rules, procedures, or laws (Pocock et al., 2012).

Further interpretation of Voydanoff (2007) adaptation of Bronfenbrenner's (1979) SEM, suggests that each of the domains overlap, intersect, and can directly impact or affect the other domain/s (**Figure 1**). The model suggests that a complex ecosystem constructs an outcome for the central individual. For the HE lecturers in this article, the intersections (mesosystems) are of particular interest due to spill over between their higher education, livelihood, and lifestyle experiences. Analysis of each domain (microsystem), intersections between the domains (mesosystems), and the demands and resources within and beyond the overarching macrosystem, matter to outcomes. While the model is displayed in a tripartite form, the balance between domains, and intersections across domains, makes analysis of influences and impacts unique for every individual. Comments from Anna and Hana follow to illustrate their initial impressions regarding the Covid-19 lockdown.

> *Anna: I was in a Work Integrated Learning (WIL) supervisory meeting with a third year BSR student when an on-campus security guard popped his head into the meeting room and said, "You need to leave the building by 12 pm. We are in lockdown, so take everything you need, with you". I felt somewhat stunned even though we had received a heads up from our Prime Minister in her daily announcements, some days earlier. Almost robotically, I advised my student of our next meeting, agreed a plan of work to be completed, and finished the meeting. I recall drifting along the corridor to my office in a dream-like state, feeling numb, trying not to let the sense of panic rise. My steady, rational self, took over. I systematically downloaded files and documents for all my AUT courses and papers, from my PC to a portable hard drive. I had a strong sense of relief and gratitude that I had used this backup system many times so I felt reassured and confident that I could deliver course content remotely, although quite how and when, I was not sure.*

> *Hana: Within 2 days of New Zealand going into lockdown we were told by AUT that we were to teach papers in blocks. Students would study one paper only for a 4-week period before moving on to the next paper. I was in shock, re-envisaging teaching a practical based paper in a 4-week block and completely online. How was I supposed to do this? As a paper leader I needed to understand how this would work and then convince my colleagues who were teaching in the same paper, that we could be effective, and students could meet the paper learning outcomes.*

DEFINING KEY DOMAINS AND INTERSECTIONS: THE SOCIO-ECOLOGICAL SYSTEM OF HIGHER EDUCATION EXPERIENCE, LIFESTYLE, AND LIVELIHOOD

Applying the conceptual framework of **Figure 1**, the domain of higher education experiences constitutes the lecturer's online

FIGURE 1 | An ecological systems model of higher education, livelihood and lifestyle experiences. Note: Based on Voydanoff (2007) adaption of Bronfenbrenner (1979) ecological systems model.
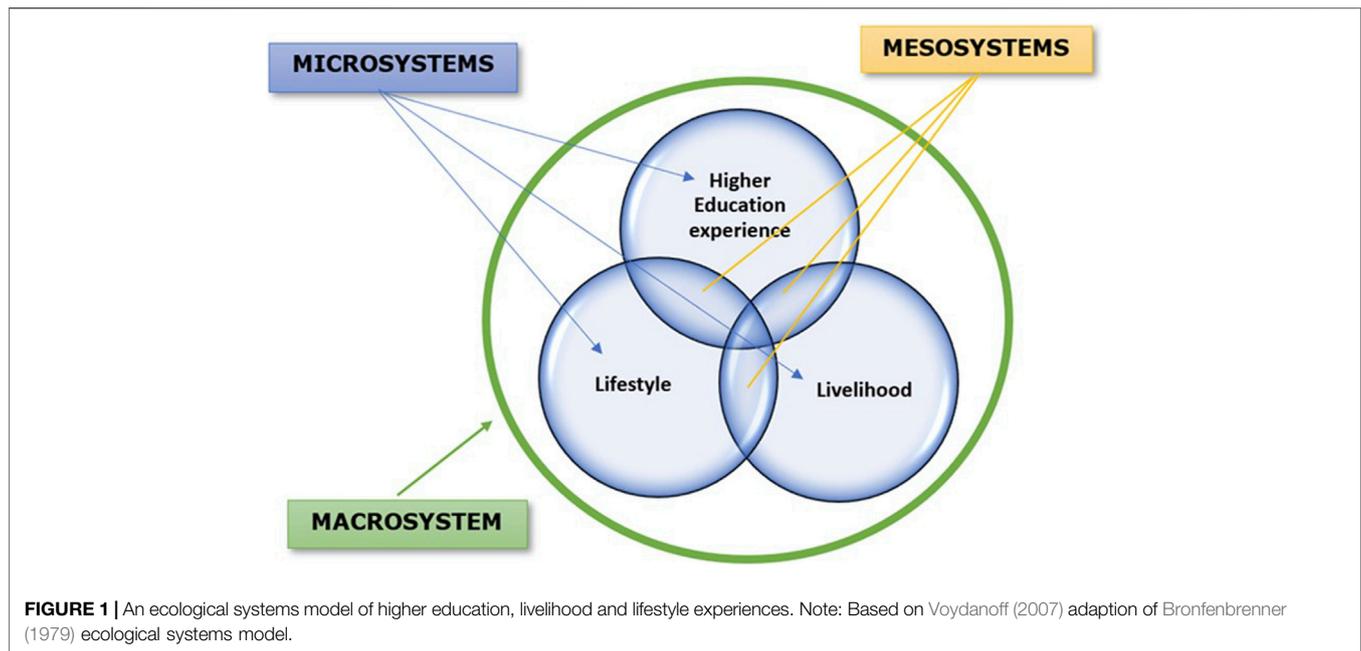
learning experience, systems engagement, and the pedagogical environment created during the 2020 lockdown. This domain was significant as the lecturers were both experienced teachers in tertiary education but had not experienced "carte blanche" online teaching and learning in any educational context, previously.

During this time, at their Auckland-based university, the higher educational landscape emerged as a complex domain of several levels. The first being that "norma"' on campus teaching and learning was replaced (after some delay) with an "alternative" online version. All face-to-face delivery was cancelled, and lecturers were expected to engage with students through the university's online learning management system (Blackboard) and two intranet platforms: Panopto and Collaborate. The second level comprised systems of communication between the organisation, its staff, and its students. This level of communication was created to disseminate information, to provide platforms for collaboration and decision-making, to share new policies, procedures, and practices, to diffuse anxiety, and to reassure. Changes to HE experiences within this level included multiple daily video-conferencing meetings dependent on the lecturer's roles and responsibilities, electronic communication (email, staff announcements), and new procedures for student tracking and monitoring. Third level factors within the HE domain encompassed prevailing technologies, access to technology, expertise and confidence using available technologies, ICT support and troubleshooting, increased staff workload relating to producing "virtual" versions of course resources, and increased student flexibility pertaining to engagement with the new learning technologies. Finally, the speed of the spread of the coronavirus globally was important, where factors like closing borders, self-isolation, quarantine facilities, the safety of essential workers, tracing, and tracking movements, and imposing severe restrictions on all citizens, affected the ways in which the HE lecturers experienced the

higher education learning environment, during the lockdown period.

The second domain of interest, lifestyle, is represented by the government-imposed concept of a 'home bubble', that is, the people who share an individual's household, including flat mates, parents, siblings, children, and/or partner. In New Zealand, whoever was in the dwelling when lockdown was imposed (11.59 pm, March 25, 2020), constituted a home bubble. The level 4 lockdown restrictions included: one designated shopper, 1 h of exercise per day within a 10 km radius, social distancing, hand washing, sanitizing, and wearing a face mask when in public (for essential supplies or medicines). The home bubble was designed to severely limit social contact and interaction, for individuals, groups, and communities, to mitigate community transmission of the coronavirus pandemic, in New Zealand. The lifestyle of individuals within each home bubble was impacted to a greater or lesser extent, dependent on various factors, such as age, gender, workplace and type of employment, socioeconomic status, urban versus rural, access to the internet and technology, number in the home bubble, health status, etcetera.

The third domain of livelihood is embodied broadly as employment. Employment can be defined as "the state of having paid work" or "the utilization of something" (Webster dictionary, n.d.). In this article, employment pertains to the work required of Anna and Hana as full-time permanent lecturers in Higher Education. For example, in their role as educators, they were required to plan, prepare, and deliver undergraduate paper content, to review and update content in accordance with evidence-based practice, to design and deliver appropriate assessment tasks, to mark and grade assessments with feedback, and to record and report on student outcomes and progress. Concomitant with this role, lecturers had a 'duty of care' to provide pastoral support for their students, to optimize their learning success. In their role as researchers, Anna and Hana were

required to engage in research projects, funding bids, writing, and publishing, either individually or in collaborative teams. Another key area of work for lecturers in higher education is to provide leadership and to promote innovation. As a "University for the Future", Anna and Hana's institution stated their vision and mission statement as providing "innovative, technology-rich, entrepreneurial, experiential university and learning environments that produces civically active and market-ready graduates" (aut.edu/about us, n.d.).

Within the limitations of this article, the domain of livelihood encompasses "paid" employment, within the HE lecturers' home bubble (family microsystem) due to the Covid-19 lockdown restrictions. Unpaid work in the form of childcare, household tasks, transportation, and support for extended family (whanau[1]), is not considered within the livelihood domain for this article. Deeper analysis of livelihood includes considering "spatial" influences (the place of work, the home, community making) and "relational" influences (the relationships that make up work, household, or community interaction) (Pocock et al., 2012). Reflective thoughts pertaining to the unexpected shift from face-to-face to remote online learning follow:

Hana: Initially I was excited about spending time in lockdown. I thought I could stay in my PJs and work when I wanted. What a surprise to find the reality was not quite like that. Home was very quiet, my husband worked upstairs on the dining room table, I worked downstairs in my office. I found myself constantly checking my calendar and being on alert for incoming messages. This meant little "down time" and in fact kept me at my desk and workstation. A new reality was the video conferencing calls. What a surprise when I realised that people could see me. This then compelled me to ensure I was appropriately presented in a professional manner when on video calls. Interestingly, most of my students when on our live workshop sessions (using the collaborate function in our LMS Blackboard) chose not to turn their video on. When I enquired as to why, they had various reasons. These were: "My hair is bad today", "I am still in my pajamas", and "I am in my bedroom in the garage".

Anna: Phew. Within our home bubble my husband was working online (at a makeshift desk in our kitchen/dining room), I was working online (at a small work-space upstairs), and our two adult children were also online (in their bedrooms). I was often recording lectures or talking in Teams or Zoom meetings during lockdown. As a programme leader I engaged in up to seven online sessions per day. My home bubble revolved almost entirely around the demands and requirements of my job, with breaks for meals and occasional exercise. I recall thinking that the separation between home and work had become blurred, and it had. I established a new home routine to accommodate the needs of other family

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[1]Whanau: Māori word for family.

members but mainly to meet the demands of my employment. Equally, my family adjusted to my constant screen-time by avoiding upstairs and reducing noise to a minimum. For example, before using the blender for a smoothie they would check whether I was recording, or in an online meeting.

When reflecting on my experiences during lockdown, I realised that I was anxious about the quality of my pre-recorded Panopto lectures as I prepared for the transition from face-to-face to remote online teaching. I wanted to reproduce the "effect" of face-to-face lectures and workshops, through the remote online platforms available to us. This goal was not possible through pre-recorded Panopto lectures or the "live" Collaborate timetabled workshops. An acceptance of this fact rendered feelings of conceding to a greater force as the reality of the global pandemic hit home. As the weeks passed, I became more frustrated and stressed, mostly because my sense of "control" over the learning environment had disintegrated. This sense of disempowerment was shared by other colleagues who expressed various levels of fear, and a lack of motivation or optimism. "It is what it is" was a common phrase heard during collegial discussions online. The university's ICT team provided many helpful tutorials, online support, and responded quickly when systems failed. However, one of the disadvantages of first-timer anxiety is that "the corridor of tolerance" (McAlpine et al, 1999; cited in Hussey and Smith, 2003: 359–360) is narrower, that is, I was less comfortable shifting the locus of control to 'others'. I had a strong need and desire to master the new technological challenges myself, even though there were many constraints and unknown quantities in this endeavor.

TOWARDS A SOCIO-ECOLOGICAL SYSTEMS MODEL OF HIGHER EDUCATION EXPERIENCE, LIFESTYLE, AND LIVELIHOOD DURING THE 2020 COVID-19 LOCKDOWN

In **Figure 2**, the authors adjusted the SEC model for higher education, livelihood, and lifestyle experiences to incorporate additional factors impacting each domain: power, time, space, and life stage. According to Pocock et al. (2012) research, how the aspects of the system act and interact together, constructs the well-being of those who live in any socio-ecological system, with economic productivity and social reproduction dependent on the effective functioning of all areas of the system. The additions to **Figure 2** of power, time, space, and life stage illustrate how multiple factors can influence and have potential to act and interact, to create opportunities, outcomes, and obstacles, or to create a new system equilibrium (transformation). The impact of demands and resources identified as acting in each domain and at each intersection, generates a further level of complexity to the analysis and interpretation of each lecturer's experiences during

FIGURE 2 | A socio-ecological systems (SEC) model highlighting the multifaceted influences and interactions of Higher Education experiences, livelihood, and lifestyle on an individual's health and wellbeing during a global pandemic phenomenon. Note: Based on Pocock et al. (2012) SEC model of work, home and community.
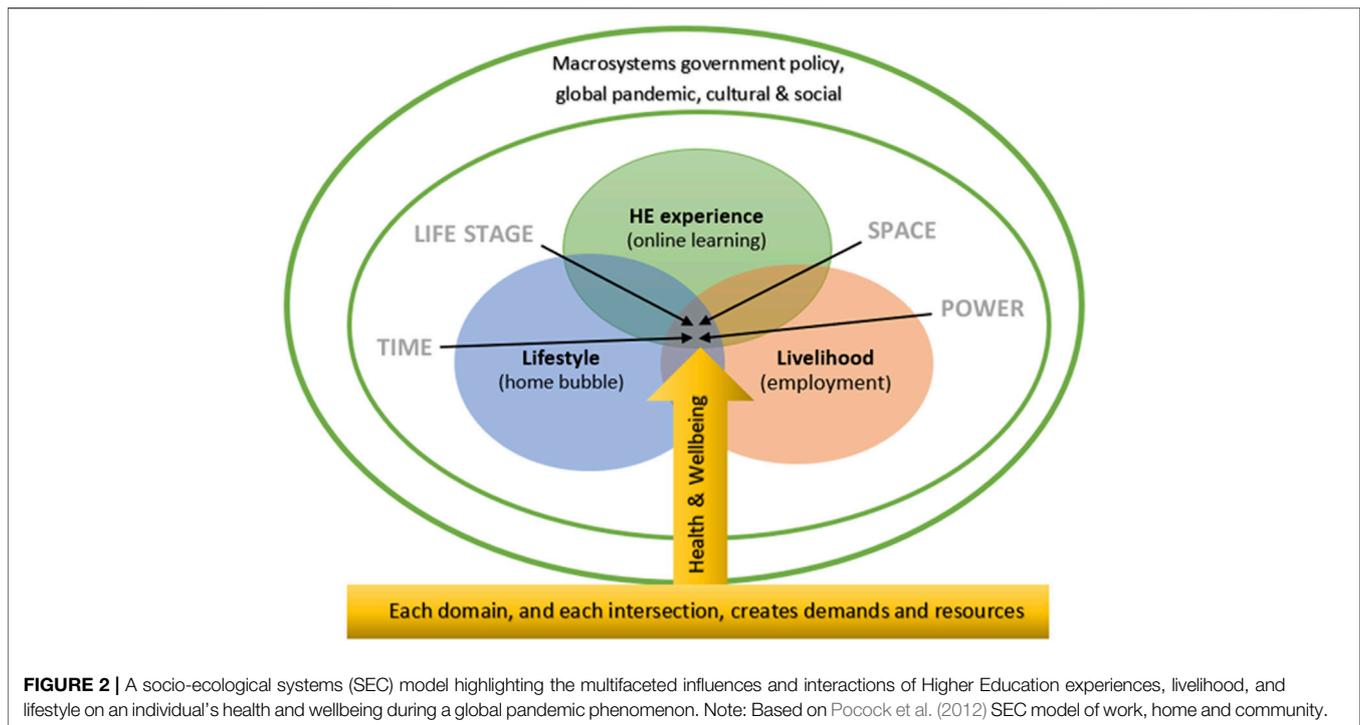
lockdown in 2020. A greater depth of interpretation and understanding was possible when conceptualizing the impacts of Covid-19 on teaching and learning, through **Figure 2** model of socio-ecological systems (SEC) theory.

The relocation of the workplace into each lecturer's home bubble, the increased demands on time due to a spill over between one microsystem and another (livelihood, lifestyle, and HE experience), sudden changes to personal spaces, and the impact on individual health and wellbeing are acknowledgment by the additions of power, time, space, and life stage. The underlying effects of demands and resources on each microsystem and on the whole ecosystem are recognised, combined with how these multiple influences impact on the individual's health and wellbeing.

Several factors are consistently relevant at each level of the higher education experience, livelihood, and lifestyle domains (microsystems). Namely, the power dynamics of students, teachers, and management teams (power), the timeframes within which information, restrictions, and resources were disseminated (time), the implications of students learning solely within their home bubble and teachers working from home (space), and the impact of these interconnected and interrelated factors on educators and students (life stage). Each of these key aspects is discussed further: *Power:* Relative to the dynamic between lecturers and their students (microsystems), lecturers and their colleagues (mesosystems), middle management with associated lecturers and administrators (exosystem), middle management with higher management structures (exosystem), and higher management structures with external governance (Ministry of Education, 2020b) and other macrosystem influences (Ministry of Health, 2017;

New Zealand Government, 2020; World Health Organisation, 2020).

Time: Relative to the timeframes within which information, restrictions, and resources were disseminated to staff and students pre, during, and post lockdown. The factor of time includes the hours spent in each domain, the predictability of these hours, the fit of hours spent in each domain with personal and household preferences, how home bubble schedules fit together, how the experience of time in each of the three domains spills over into other domains (that is, intensity of work or care). Other influences included lecturer control over time, the timing of activity in each sphere, and the way that schedules within each domain fitted together (university lectures and workshops, childcare, work hours). The intersections between domains (mesosystems) were potential sources of conflict, for example, livelihood-lifestyle, lifestyle-HE experience, and HE experience-livelihood interactions. Issues with transport may exacerbate or ameliorate the impact of time as an influence on each domain or microsystem.

Space: This includes how spatially separated and distant from each other these domains are, how long it takes to cover these distances and whether distances are virtually connected. A further consideration is physical space within the educator's home bubble, particularly regarding appropriate and sufficient space to work. Connection to the spaces pertaining to the university (campus, food hall, staff hub, administrators), home bubble, and place of employment impact the lifestyle-livelihood, livelihood-HE experience, and HE experience-lifestyle intersections, dependent on educator capacity to meet requirements (demands) and access information (resources). Lecturers who experienced restricted personal space within their home bubble

during lockdown were disadvantaged in terms of access to a conducive work environment.

Life stage: Livelihood, lifestyle and HE experience varied dependent on the life stage, that is, as mature lecturers but new and emerging researchers, Hana and Anna were experiencing a dramatic shift from on-campus face-to face delivery, to remote online teaching and learning, with little or no previous professional development for this transition. The student's life stage was an important factor in the lecturers' socio-ecological systems model, as many were also experiencing remote online teaching and learning for the first time. During lockdown, whether as a parent, an older sibling, or living with extended family, many of the BSR students had significant responsibilities in addition to their university course of study.

How these aspects of the system act and interact, constructs the well-being of those who live in a socio-ecological lifestyle, livelihood and HE experience system (Pocock et al., 2012). In the context of the Covid-19 impacts on learning in HE, a socio-ecological system that is functioning well is represented by strong, healthy, and inclusive educational practices, productive workplaces with low rates of absenteeism, injury and illness, and high levels of well-being, satisfaction, and engagement, combined with high-levels of family well-being, coherence, and support (for all age groups) (Pocock et al., 2012).

Comments from Anna and Hana follow to illustrate their deeper thoughts and feelings regarding the complexity of their experiences, and the impact of the Covid-19 lockdown on their well-being.

Anna: New Zealanders were often referred to as "A team of five million" (Prime Minister's daily announcements, April 2020). This was inspiring and gave purpose and direction when many aspects of our livelihood and lifestyle were completely disrupted. In relation to time, the shift to working full-time from home meant that each day was essentially the same with multiple meetings online, and an increase in electronic mail, phone calls, and queries. The extended hours of screen-time became exhausting; mentally, physically, and emotionally, affecting my Hauora[2] (Durie, 1998). The physical separation from colleagues and students impacted negatively on my social wellbeing. I experienced a feeling of loss of connection to people and place. Being contained within my home bubble signified a constraint on my ability to access "normal" spaces such as the university campus, classrooms, the stadium, gym, the staff hub, etcetera. Part of who I am as an educator hinges on the ambience and atmosphere I create and facilitate in a learning environment. The removal of this connection with colleagues and students unhinged an essential characteristic of who I am as a lecturer. My attempts to reproduce the ambience and atmosphere of face-to-face teaching and learning was thwarted due to

my own dissatisfaction with talking to and through a screen. On reflection, I am not comfortable using digital and electronic delivery platforms to communicate in a meaningful way with others, although I can utilize these tools successfully if, and when required to.

Hana: I too have reflected on my Hauora as I spent time in lockdown, in a teaching and learning environment. Certainly, the physical separation was easy to accept mainly because we had no choice, however, the social disconnect, was something that I struggled with. I like speaking face-to-face and interacting with my students in a classroom and lecturing environment and therefore, using the online platform was not ideal for that social interaction. I really appreciated the collegial support I received from lecturers in my team and from our administration support staff. This was from simple gesturers such as "How are you going today?" to "What technical support do you need?" I also reached out to my students when either on email or in our live collaborate sessions to do the same. This resulted in a community of practice developing (Lave and Wenger, 1998). Students within the papers also spent time "chatting" at the beginning. This was mostly on the chat function in Collaborate. Interestingly they wrote messages to each other, rather than talking directly. I, like Anna, liked the familial or whanau focus on lockdown, despite my bubble being very small. I still felt very safe and supported, with my husband being in my bubble at home. In terms of the spiritual dimension of Hauora, I sometimes struggled because I was unsure about the future, and from a global perspective I worried about what was happening in other countries in the world, and to my daughter who was living in Australia. And therefore, that sense of connection was broken.

DEMANDS AND RESOURCES IN THE INTERACTING DOMAINS OF HIGHER EDUCATION EXPERIENCES, LIFESTYLE, AND LIVELIHOOD

The abrupt transition from face-to-face to remote online teaching and learning created unprecedented demands on HE lecturers, and the need for specific resources for staff and students that had not been anticipated.

The pedagogical environment provided during the 2020 lockdown in New Zealand, was mostly effective, and met the needs of many students enrolled in the Bachelor of Sport and Recreation degree programme. Anecdotal evidence from informal discussion with students after the lockdown indicated that a small group of the BSR cohort had substantial challenges coping with the abrupt shift to online learning strategies and delivery platforms, however, many students were able to adapt and engage relatively seamlessly to the new pedagogical environment. A concerning number of students reported experiencing greater pressure on their time due to demands

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[2]Hauora: Māori philosophy of health unique to New Zealand. It comprises taha tinana, taha hinengaro, taha whanau, and taha wairua (Durie, 1998).

from their home bubble, workplace, or other commitments, which impacted on their level of stress, and confidence regarding study success going forward. Anecdotal evidence from lecturers indicated that the quality and reliability of the teacher-learner relationship was crucial to success, and that clear, informative, and reassuring communication from management (exosystem), with plenty of forewarning was appreciated by staff and students, as was the prompt response to questions or technical issues (exosystem). Factors that were outside the university's direct sphere of control (the lecturers' and students' livelihood and lifestyle—micro and mesosystems) appeared to have some detrimental influences on teaching and learning, health and wellbeing, and successful outcomes when the demands on or resources of space, time, and/or power, were compromised. For example, when a lecturer had dependents at home who needed to be "home-schooled" this compromised their time "at work", when there were insufficient electronic devices within a home bubble this compromised access to content and live interactions, and when physical space was limited due to the needs of others within the home bubble, the creation of a conducive teaching and learning environment was contested. Reflective thoughts regarding the impact on educators of increased demands, and the access and availability of resources, follow:

Hana: My thoughts about the lockdown impact on teaching and learning focused on my students' expectations of me. I felt I was on-call 24/7. This feeling of always checking my emails, ensuring I met my students' needs in a responsive way, was quite demanding. I know that students in higher education are independent learners, however, after teaching at secondary school level I felt that my students were back down at that secondary school level, that is, they needed to be guided and stepped through every week, what they needed to know and what they needed to learn for that week. In particular, the assessments, there was a lot of stress around the assessments, and my students were anxious about whether they understood what was required. This was despite our course guide being very detailed with information about assessments, including additional documents uploaded on a "needs" basis. We found we were holding additional "live" online teaching sessions. Question and answer sessions, where students could come into the online environment and ask questions, 90% of which were about the assessments. This demonstrated to me that they were not confident in obtaining the information required and they weren't able to document the information in a way that gave them confidence about being able to achieve a successful grade in that assessment. Self-directed learning in HE is paramount and requires a degree of independence. I think our students were not at the stage where they were fully independent and able to manage study by themselves. Having a lack of confidence, also increased their anxiety, and their neediness. When I discussed some of these concerns with other colleagues, they too

found the same situations. This impacted on how I explained and used the lockdown environment to give them more information. To address this concern for our strongly kinaesthetic students, I suggested additional places for further information, for example, websites which had video illustrations. In a normal face-to-face environment, we would call these "learning conversations", however, this was not possible in a lockdown environment, and because of the social distancing, communicating over email or a video call was not conducive to quality teaching and learning.

Anna: The demands that had the greatest impact on me as a higher education lecturer resulted from, an overload of information, and an increased workload. During lockdown, information was disseminated via several online sources, via 1) all-staff emails, department, ICT and personal emails, 2) online meetings using Microsoft Teams or Zoom for senior management, department, programme, paper and collegial information sharing, and 3) the university's Blackboard and Collaborate intranet platforms for staff-student information sharing about changes to assessments, workshop times and dates, designated lecturers, and how to access resources or troubleshoot issues. The division between home and work suddenly evaporated. Instead, nearly all information sharing was work-related.

A marked increase in workload occurred at the same time as lockdown was imposed. I had 24-h internet connectivity at home so there was no excuse "not" to complete content changes, to update course outlines, or to record lectures ahead of deadlines. And there was nowhere to go as travel restrictions were stringent. When I struggled to insert YouTube clips into a Panopto recording I learnt the procedure by watching online tutorials or via a virtual lesson with an IT tutor. I was spending more than 10 h a day on my screen. My workload during 'normal' on campus teaching and learning varied from as little as 2 h (a face-to face lecture using PowerPoint) up to sometimes eight or more hours during intense assessment marking and results generation. Continuous on-screen hours, day after day, was unprecedented. Before the Covid-19 pandemic my employment was predictable and secure, and my lifestyle was settled and balanced. During lockdown, all facets of "normality" seemed to disappear, being replaced instead with a constant round of words, images and faces on my screen. So, how did these extra 'lockdown' demands on my time, personal space at home, and increased interaction with colleagues (but not students) impact on my wellbeing? Not well.

Positions of power (management and leadership positions within the university) determined our workload and ways of working. An initial reaction I had was to question the rationale for "freezing" regular communication with our students as we had completed

just 4 weeks of the university first semester. As a programme leader I sought clarification and an explanation regarding providing pastoral care for new students but was advised that mixed messages (from staff other than senior management) were potentially more harmful. The enforced separation of lecturers and students at this time affected my taha whanau. Feeling distressed and powerless, I decided to step down from my programme leader role.

SOCIO-POLITICAL FACTORS INFLUENCING DEMANDS, RESOURCES, AND WELLBEING IN EACH HIGHER EDUCATION EXPERIENCES, LIFESTYLE, AND LIVELIHOOD DOMAIN, AND THEIR INTERACTION

This section explores the larger macrosystem influences on Hana and Anna's socio-ecological system during the Covid-19 lockdown 2020. This section provides insights about the intersections between and across each lecturer's microsystems of lifestyle, livelihood, and HE experiences, plus an understanding of the impact on teaching and learning from outside factors, such as, guidelines from international bodies, government directives, and institutional policies and procedures. Further insights can be gleaned from considering the effects of relationships, connections, and interactions, within each lecturer's micro and mesosystems.

An example of the sudden change in these relationships was the emergency shift to remote online learning, in response to the Covid-19 crisis. This occurred almost overnight. Students were informed of this change and were advised to prepare for full online learning, from within their home bubble. Programme leaders and paper coordinators were advised to prepare all necessary materials and resources. Online delivery commenced on April 28, 2020, 4 weeks after (March 24, 2020) a state of emergency was announced, and the level 4 lockdown restrictions were imposed. Comments, anecdotes, and musings follow regarding the impact of external factors and influences on Anna and Hana as they navigated teaching and learning during the Covid-19 lockdown 2020.

Anna: I watched the 1 pm updates on television with my family each day. Our Prime Minister and the Director General of Health spoke in reassuring tones, but the messages were clear and direct. "Stay at home. Save lives". We tried to get our heads around the new terminology and what the differences were between the categories of transmission, infection, or outcomes. Fascination and curiosity were mixed with a growing concern for the health of self, others, our New Zealand communities, and people of all nations. The impact on lifestyle was immediate and dramatic. While it was novel for a few days, once understanding emerged, the severity of the situation became all too apparent. Within our

home bubble our family talked through the what now and what next scenarios. We took heart at the strong measures taken by the government to close our borders, to enforce new social contact regulations, to constantly inform everyone in an open and honest manner.

On reflection, my self-imposed screen-time limit of 7 pm worked well to guarantee I continued to have "time" with family. Conversely, I under-estimated the fatigue involved with so much digital exposure when my usual work-life balance was face-to-face, interactive, social, and sporadic (albeit timetabled for the working week). The crossover effects of constantly communication with the university, working from home, and trying to create some semblances of a normal lifestyle were that I increasingly felt dis-empowered, distressed, and "over" being displaced and disconnected from students and colleagues. My lack of tolerance for the imposed social, emotional, physical, and psychological separation came as a surprise to me but has provided deep learning regarding my motivation and enthusiasm to continue to facilitate learning in a blended format, within a HE context.

Hana: In my role within the Faculty as an Academic Advisor, I felt responsible for doing additional reading and investigation, not only for block learning but also about the adoption of online learning and teaching that was expected of lecturers, by management. I did not mind doing this (actually, I was quite curious) because I was intrigued by how we could turn face-to-face lecturing into engaging, short, snappy, online presentations that could be viewed several times over by students. It was a steep learning curve to master pre-recorded video lectures and produce slideshows using new (Panopto) software. However, I found this challenging but also stimulating, as I was concurrently learning new technologies and navigating IT systems, while also teaching remotely. Students told me they preferred Panopto lectures because they could view them several times over, and they could also turn up the speed of the voice delivery to 1.5 or two times the speed. I was amused by this.

DISCUSSION

Within the context of the Covid-19 lockdown in New Zealand, the autoethnographies of lecturers Hana and Anna reported a range of reactions and responses to their abrupt change to remote online learning, as identified below.

While the disruptive move from "normal" face-to-face teaching and learning to remote, online platforms was unprecedented, the effects and impacts of this forced shift were under-estimated, occurred without sufficient planning or preparation, and tested individuals and institutions to new limits. Anna and Hana's reflections highlight: the loss of power within and across their HE experiences, impactful changes in the space and place of employment (livelihood), coupled with an array of expectations and demands on their skills, time, and energy while

functioning under lockdown restrictions within their home bubble (lifestyle). Both lecturers recognised the importance of the decisions they made and actions they took within each microsystem (domain), especially in relation to their ability to function as educators through a completely different delivery medium (online). Anna and Hana voiced their concerns about information overload, increased workload, a lack of "down-time", and the impact their new "normal" had on their Hauora (well-being). Concern was expressed regarding the anxiety and lack of confidence displayed by students during remote online teaching and learning during "live" sessions. Additional support and information was essential to reassure and offset many students' sense of confusion and impending failure. Apart from the online platforms provided by the university, lecturers also utilized other measures to support and sustain student engagement and learning, for example, via text messages, electronic email, video conferencing, online Question and Answer sessions, chatrooms, and one-on-one phone call tutorials. A major concern was for the well-being of staff and students, including retaining students in their programme of learning.

Considerations going forward include the need to recognise and manage uncertainty; the integration of affect and cognition; and the recognition and acceptance of human limitations when faced with exceptional and unexpected trauma (Linley, 2003). The American Psychological Association (2012) comment on this consideration further, offering constructive suggestions to develop resilience during extra-ordinary circumstances, by building connections, fostering wellness, finding purpose, embracing healthy thoughts, and seeking help when needed.

Key learnings for lecturers Anna and Hana began to emerge from their self-reflective practice, both personally and professionally, as evidenced from their shared insights. The interaction or spillover from one microsystem to another, interwoven with influences from external managers and leaders (exosystem level) as well as the macro factors that affected all citizens during the coronavirus pandemic, however, were recognised as detrimental to their work-life balance, mental and social well-being, and sense of value within the wider socio-ecological system of the university. At ground level, it was clear that the student-educator learning partnership was the highest priority for Hana and Anna, with no limits on how they optimized communication, information, and learning, albeit through virtual platforms. This dedication and determination, to retain and to sustain students, was a shared focus across the HE sectors (Wilson et al., 2020).

Returning to the authors' earlier claim that socio-ecological models are helpful to represent the "true" influencers of an individual might be a misrepresentation of the complexity of the whole ecological system. According to Stanger, (2011) research, a reorientation of socio-ecological models to "eco-sociological models" through which the environment and changes to the environment (political, economic, social, physical, and educational) can have substantial impacts on the individual, community, and larger society connected to and associated with that eco-sociological system, are the next step. This view is worthy of serious consideration as reinforced

through Hana and Anna's self-reflective approach to the impact of Covid-19 on their lifestyle, livelihood, and HE teaching and learning.

CONCLUSION

According to Bauman (2001), the most important learning for individuals in postmodernity is the capacity of the learner to unlearn and "adapt to uncertainty" (p. 125). As lecturers, Hana and Anna were learning to 'unlearn' their previous 'normal', while also learning new technologies and navigating alternate IT systems. The challenge in education as in life is to adapt and to succeed, whatever the circumstances. Drawing on the socio-ecological systems framework (**Figure 2**), Anna and Hana described the demands and resources that arose from each of the domains of their higher education experience (new technologies, remote online teaching, and learning), lifestyle (home bubble, work-home balance), and livelihood (employment, workload), aligned to their well-being as HE lecturers.

While valuable insights and learning have occurred through the conceptual, interpretative, and reflective processes presented here, the significance of Hana and Anna's experience is: 1) Learning in higher education. Whilst systemic change and adaptations are imperative during times of crises, a "one-size-fits-all" is not always conducive for learning partnerships, between lecturers and students. Students in Sport and Recreation courses of study who enact primarily through kinaesthetic contexts were compromised in their learning, creating additional expectations and pressures on lecturers to ensure that authentic and appropriate learning and assessment occurred. 2) Lifestyle. The impact on HE lecturers during the Covid-19 pandemic precipitated a forced change of the delivery platform from on campus to each lecturer's home bubble. This created unprecedented impact on the work-home balance of educators. Social isolation, being disempowered, and expectations of availability 24/7 combined to create a sense of feeling overwhelmed. Some reassurance existed through collegial support and the IT Help services, however, individual lecturers reacted and responded differently, with some finding this more challenging than others. 3) Livelihood. While there were many issues relating to their employment situation and environment, Anna's, and Hana's first response was to optimize student learning. The challenges of grappling with new technology and IT systems caused stress and anxiety due to striving to meet high university-level academic standards. This was exacerbated by self-imposed perfectionism when delivering online, synchronously, and asynchronously. 4) Well-being. The importance of well-being for individuals who live in any socio-ecological system is paramount (Pocock et al., 2012). Applying the domain in **Figure 2**, Anna's, and Hana's degrees of satisfaction and engagement as HE lecturers during the Covid-19 lockdowns, were reflected through their open and authentic self-reflective accounts. Impacts on social and spiritual well-being were revealed through collaborative thematic analysis and the sharing of experiences. Hana and Anna's recall of familial support

systems demonstrated the importance of social well-being when navigating through the exceptional circumstances of a pandemic.

Anna's, and Hana's personal experiences during the Covid-19 pandemic forced them to manoeuvre through uncertainty to deliver and support student learning. Further investigation of 'student' voice is recommended to enhance understandings gained. Recommendations for future pandemic situations include ensuring that all domains of an individual's socio-ecological systems framework (**Figure 2**) are considered, for students and educators alike.

Study Limitations

As qualitative researchers and educators, Anna, and Hana's position grants extensive knowledge about the inner workings of higher education as an institution, which is generally regarded to be an advantage in qualitative research (Thagaard, 2003). This reflective and reflexive autoethnographic approach shaped the interpretations and synthesis of self-observations and self-reflections within the identified theoretical framework. Therefore, the analysis and discussion represent one interpretation of the impact on teaching and learning during the Covid-19 lockdown, viewed by Hana and Anna through their

socio-ecological framework of higher education experiences, livelihood, and lifestyle.

ETHICS STATEMENT

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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A New Reality: The Role of Simulated Learning Activities in Postgraduate Psychology Training Programs

Australian Postgraduate Psychology Simulation Education Working Group (APPESWG)

In training to become a registered psychologist in Australia, as with many other countries, there is a requirement for students to attend placements, where they work with clients in an apprenticeship model under the guidance of qualified supervisors. In the context of COVID-19, tertiary sector psychology educators responsible for facilitating these placements, which typically require face-to-face client work, have been challenged to arrange or maintain practica. During the pandemic, across Australia, most placements have been affected through cancellation, postponement, or modification (e.g., using telehealth, supported by the Australian Federal Government). In this paper we describe a collaborative initiative by members of the psychology profession across 15 providers of Australian postgraduate professional training programs. The initiative aimed to identify ways in which to develop and innovate psychological placement offerings, specifically using simulation-based learning. Although simulation-based learning in psychology training programs in Australia is a widely employed pedagogy for the scaffolding of theory into psychological practice, there is paucity of clear and comprehensive guidelines for the use of simulation to both optimize competency-based training and ensure public and student safety. The overarching aim of the group, and the focus of this paper, is to provide standardized guidelines for the inclusion of simulation-based learning in psychology training in Australia both during and post-COVID 19. Such guidelines may be equally valuable for psychology training programs globally.

Keywords: simulation-based learning, professional psychology, competency-based training, Australian psychologists, psychology training and education

INTRODUCTION

COVID-19 dramatically shifted how education and health services were delivered in Australia in 2020. While some tertiary education providers in Australia were already utilizing online delivery, not all had embraced this format. The sudden shift to online delivery caused several providers to reconsider training modalities for their professional psychology students. At present, there are no set standards or guidelines in Australia for simulated learning activities (SLA) in the context of professional psychology programs.

The Australian Postgraduate Psychology Education Simulation Working Group and the Aims and Objectives of This Paper

The following paper is a version of a document prepared by the Australian Postgraduate Psychology Education Simulation Working Group (APPESWG), consisting of representatives from 15 postgraduate psychology education providers across Australia. The paper covers the impact of the COVID-19 pandemic on higher education in Australia and specifically the implications for practical training components of postgraduate psychology training. We provide the background and context for training as a psychologist in Australia, review the literature regarding simulation-based learning and education (SBLE), and provide guidelines for the ethical SLA into postgraduate psychology training. Finally, we cover the processes of having these guidelines accepted by postgraduate psychology education providers across Australia and the relevant regulatory and accrediting bodies, alongside areas for potential research. The primary aim of this paper is to provide educators of psychology postgraduate training programs with guidance in the design and implementation of SLA.

COVID-19 and The Impact on Education in Australia

During the COVID-19 pandemic, tertiary education providers across Australia had to grapple with impact of physical distancing and health restrictions on psychology training placements. These impacts fell along a continuum from substantial delay through to being unable to progress which, in turn, has flow-on effects. The cessation of placements not only halts student progress but potentially leads to a backlog of students and a workforce shortage if training cannot continue for extended periods. Such outcomes are particularly problematic given the projected ongoing impacts of COVID-19 on psychological health and wellbeing over the coming years (Simon et al., 2020), placing increased demands on an already under-resourced psychology workforce. The integration of SLA combined with telehealth is one way that trainee psychologists can continue to gain clinical skills and accumulate required practice hours whilst adhering to the physical distancing requirements set by State and Federal governments. It is arguable that the training crisis of psychologists caused by the restrictions associated with COVID-19 has provided an opportunity to further investigate SBLE as a training tool for the psychology profession, and may also provide an avenue to remedy the contraction of postgraduate psychology training programs across the country.

A challenge of health professional training is finding the balance between providing an authentic experience so that newly qualified professionals are work ready vs. ensuring trainees learn skills in a safe way to protect the public. The use of SLA provides one medium to balance this risk, and as technology (i.e., video/graphics, artificial intelligence, and person machine integration) continues to improve, the use of these media to support this becomes a more viable option (Rudd et al., 2010; Graj et al., 2019). SLA can provide an avenue to increase capacity to train psychologists when placement availability may otherwise limit the number of graduates entering the workforce.

Postgraduate Psychology Training in Australia

Tertiary Education

Tertiary education providers in Australia are regulated and accredited by the Tertiary Education Quality and Standards Agency (TEQSA) and must adhere to the Australian Qualifications Framework (AQF; Australian Qualifications Framework Council, 2013, January). The AQF is the national policy for regulating education and training in Australia. The policy provides the standards for learning outcomes for each AQF level and qualification type in Australia. Postgraduate psychology programs are considered an AQF Level 9 qualification and are referred to as a coursework masters, as opposed to a master's degree by research–a doctoral degree is a Level 10 qualification. All providers of postgraduate psychology training programs must be able to demonstrate that graduates of these programs have attained a level of advanced knowledge and skills in the field of psychology.

Psychology Programs

Tertiary education providers of psychology programs that lead to graduates being eligible for registration by the Australian Health Practitioner Regulation Agency (AHPRA), must be accredited by the Australian Psychology Accreditation Council (APAC). AHPRA is the national agency that implements the National Accreditation and Regulation Scheme and works with 15 different health practitioner boards, one of which is the Psychology Board of Australia (PsyBA; Australian Health Practitioner Regulation Agency, 2019). The title "psychologist" is protected under National Law in Australia with heavy penalties imposed for using the title when not qualified to do so (Health Practitioner Regulation Law (ACT), 2019). Psychologists are registered as either Provisional or [full] General and must have completed an approved sequence of training as specified by APAC (details below). Psychologists who have completed a specific sequence of postgraduate training and further professional development may be eligible for an Area of Practice Endorsement (AoPE; Psychology Board of Australia, 2019). There are currently nine different AoPEs, with the most common being Clinical Psychologist (Australian Health Practitioner Regulation Agency, 2019).

APAC accredits undergraduate and postgraduate psychology degrees (AQF Levels 7–9) and provides standards (Australian Psychology Accreditation Council, 2019a) and guidelines for evidence (Australian Psychology Accreditation Council, 2019b) that tertiary education providers must meet in order to attain or retain their accreditation status. Programs are typically accredited on a 6-year cycle and education providers must demonstrate appropriate evidence that they are meeting the APAC standards, or they may lose their accreditation status. At present this

evidence consists of graduates meeting various competencies as determined by APAC at different levels.

There are currently four levels of APAC competencies that graduates are required to attain by the end of their degree. Level 1 are the Foundational Competencies, which are typically included in a 3-year undergraduate degree (AQF Level 7 Bachelor Degree). Level 2 are the Pre-Professional Competencies with programs at this level typically resulting in an Honors Degree (AQF Level 8), a fourth year, which is the minimum academic qualification to be eligible for provisional registration in Australia (Psychology Board of Australia, 2017) and entry into a postgraduate psychology training program (AQF Level 9). Level 3 are the Professional Competencies and Level 4 are the Professional Competencies for Specialized Areas of Practice. Levels 3 and 4 are typically 1 year in length each. Graduates of a Level 3 course of study can then apply to do a 1-year internship under the supervision of a PsyBA approved supervisor, alongside meeting other professional development requirements, and gain full general registration. Graduates of a Level 4 course of study can apply for a 2-year registrar program reflective of their specific degree (e.g., Clinical, Health, Neuropsychology) and under the supervision of a PsyBA approved supervisor, alongside completing numerous professional development requirements, apply for an AoPE. Colloquially in Australia a Level 3 APAC sequence is known as the 5 + 1 pathway, with degrees often having the title "Master of Professional Psychology" or similar. AoPE degrees typically have the named specialty in the title (e.g., "Master of Clinical Psychology," "Master of Health Psychology").

Alongside the numerous competencies that students need to meet in Level 3 and 4 programs is the requirement for a set number of hours of client-related activities and direct client contact. Students in a Level 3 course of study are expected to have accumulated at least 300 h of practicum skills and training. Graduates from a Level 4 course of study are required to accumulate at least 1,000 h of direct client and client-related activities, with a minimum of 400 h of the 1,000 coming from direct client activities.

The focus of the discussion in this paper is about the incorporation of SLA into APAC Level 3 and Level 4 degrees in a standardized empirically supported fashion. At present only Level 3 degrees have an allowance for the use of some SLA. We propose that using an evidence-based approach and the guidelines outlined in this paper, postgraduate psychology training programs can incorporate SLA into their programs in an ethical way. We suggest that the incorporation of SLA will improve trainee outcomes, ethical practice, client outcomes, and reduce the burden on training programs to find enough direct client-related hours for students, especially in the context of ongoing lockdowns and social distancing regulations.

Defining Simulated Learning

The Healthcare Simulation Dictionary (Lioce et al., 2020, p. 44) defines simulation as "a technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions." Gaba

(2007) adds that simulation is a "technique . . . to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner" (p. 126).

Simulation-based learning and education approaches are varied but may include computer-based simulation (e.g., use of avatars), standardized or simulated clients who are trained to act as real clients by simulating the symptoms and behaviors of an illness, manikins, virtual reality, objective structured clinical examinations (OSCEs), and role plays (Bearman et al., 2013). **Table 1** contains a comprehensive outline of various simulated learning activities relevant to professional psychology training.

Benefits of Simulation-Based Learning and Education

"*There is a huge disconnection between knowing something in abstract and being able to make that knowledge actionable.*" (Galarneau, 2005, p. 3).

Although Australian postgraduate psychology courses have utilized SBLE for over a decade, to date there has not been a systematic uptake or benchmarking of this teaching approach at a national level. The reasons for this include financial and workload impacts associated with implementation, limited empirical evidence regarding its efficacy in the Australian context, and current APAC standards limiting this approach for accrual of placement hours in Level 3 and 4 postgraduate psychology training programs. However, given the unique and unprecedented challenges experienced due to the COVID-19 pandemic, there has been renewed interest in this pedagogical approach to ensure high quality learning experiences and outcomes that facilitate progression towards achievement of graduate competencies irrespective of access to traditional placement experiences. In the current global context, SBLE allows educators to continue the vital education and development of psychologists, addressing some of the barriers associated with placement loss. SBLE provides several additional opportunities (detailed below), both as an educational approach and a framework for competency-based assessment (McNaughton et al., 2008; Butler et al., 2009; Kameg et al., 2010; Maas and Flood, 2011; Stegmann et al., 2012; Milkins et al., 2014; Nestel et al., 2017).

Bridging the Gap. By integrating SBLE in psychology, courses trainers can address the disconnect between knowing and making knowledge actionable, as identified by Galarneau (2005). Research indicates that SBLE increases students' confidence and competence by providing a bridge between classroom theory and workplace practice (Cybulski et al., 2010; Rudd et al., 2010).

Supporting a Safe Learning Experience. Simulation provides a structured, learner-centered environment where students can learn and practice skills without causing harm to clients (Bearman et al., 2013). Risk to students can also be mitigated by providing opportunities to practice risk management skills before placement (Graj et al., 2019), identify and discuss professional and ethical issues raised in SLA, and gain confidence with peers before the additional pressures of real-world practice are added.

Ensuring Curriculum Control. While placement provides an excellent opportunity for learning and socialization into the

TABLE 1 | Definitions of the types of simulations.

Simulation type	Definition
Computer-based simulation	Interactive virtual simulation that comprises of inputs and outputs and is often in the form of virtual clients or virtual reality. Computer-based simulation has the benefit of simulating a range of different virtual environments where participants can make decisions and see the outcomes of their clinical selections
Hybrid-based	A combination of different simulation modalities, (e.g., manikin and simulated client)
Standardized/simulated client	A trained actor who plays the role of a client in a simulation
Role play	Students adopting the role of a character from a script developed by a trained academic
Virtual reality	High fidelity two- and three-dimensional virtual environments that may include sensations resulting in greater authenticity

Note: Adapted from Milkins et al. (2014) and Lopreiato (2016).

workplace environment, it is difficult to control the quality of a student's experience and the breadth of client presentations they encounter. SBLE builds in a degree of curriculum control not provided within workplace contexts, supporting equality in students' learning experience and ensuring all students can access a breadth of health disorders and symptoms including low prevalence presentations in their studies before they are fully qualified.

Supporting Sustainability. While cost has been identified as a barrier to SBLE, once developed, many SLA are sustainable. Those delivered online or using virtual methodologies are far less susceptible to the global challenges that are currently faced by services offering direct client contact (Rudd et al., 2010).

Developing Appropriate Illness Scripts. SLA may be useful in the development of appropriate or typical illness scripts. An illness script or schema is a collection of knowledge that embodies the common characteristics of a condition, providing a basis for typical to which atypical can be later quantified (Custers, 2015; Strasser and Gruber, 2015). Custers (2015) notes that illness scripts are developed by both doing and observing, making this ideal for use in SLA. Importantly, illness scripts are difficult to shift once developed so exposing students to typical cases under controlled environments helps to manage the potentially challenging influence of atypical scripts presented early in training.

Teaching High Stakes, Low Frequency Events. SLA comes into its own when teaching the skills necessary to manage high stakes (risky), low frequency (unusual) clinical events. These events, by their very nature, may not occur during placement, but ensuring that students have the skills to manage them is essential to ensure workforce ready graduates.

Student Engagement and Outcomes. Students trained with SBLE are additionally engaged, better prepared and more competent, resulting in greater ability to meet the demands of a range of placements and client presentations spanning a continuum of complexities, and thereby develop more appropriate workforce skills (Cybulski et al., 2010; Sheen et al., 2015). SBLE is also a recognized work integrated learning activity and thus has direct application to the development of employability skills (Orrell, 2011).

Current Use of Simulated Learning

The use of SBLE in training and assessment is a widely used and accepted practice in a number of health-related fields, such as nursing and medicine (Kühne et al., 2018) and there is a large

volume of research on SBLE in health professional education (Cook et al., 2011). Nursing and medicine have successfully used SBLE in several ways (e.g., use of high-fidelity manikins that enable students to acquire clinical skills in respiratory assessment, heart rate, and blood pressure (Mutter et al., 2020), with some tasks implemented using integrated scenarios to foster clinical decision making and reasoning (Cantrell et al., 2017). There are also multiple forms of SLA, including simulated and standardized clients, virtual reality, manikins, role-play, computer simulation and voice simulation. Simulated clients are actors who role-play the client (Chur-Hansen and Burg, 2006); standardized clients are also trained to provide consistent responses to the students (Kühne et al., 2018).

SBLE has been utilized as a modality in other health professions for at least 2 decades with multiple systematic reviews and meta-analyses having been conducted on the effectiveness of this method of training (e.g., McGaghie et al., 2010; Cook et al., 2013; Gegenfurtner et al., 2014; Vandyk et al., 2018) with best practice training guides published for use of SBLE in healthcare training (Motola et al., 2013). SBLE has been trialed in social work (e.g., Dodds et al., 2018) and psychiatry (e.g., Ajaz et al., 2016) with promising results. SBLE has been successfully used to train front of house staff (i.e., reception and administrators) in specialty psychosis services for how to interact with effectively with clients (e.g., Baumeister et al., 2015). Physiotherapy and occupational therapy have also successfully utilized simulation in training (see for example, Bennett et al., 2017; Tuttle and Horan, 2019).

Of note, most of the learning theories and pedagogical foundations for using SBLE are couched in psychological theories (e.g., Rutherford-Hemming, 2012). The use of actors and standardized clients is common in SLA (e.g., Keltner et al., 2011; Alexandera and Dearsley, 2013; Masters et al., 2015; Edwards et al., 2016; Kühne et al., 2018; Meghani and Ferm, 2019), with best practice standards also published for the actors themselves (Lewis et al., 2017).

Simulation-Based Learning and Education in Professional Psychology Training

In Australia, SBLE for psychology has involved the use of a range of SLA, from general techniques such as role plays and the use of OSCEs through to competency training in areas such as mental state assessments and empathy skills training (Beccaria, 2013; Sheen et al., 2016). The media used in psychology SLA can include live or recorded actors, or decision-making virtual

reality scenes. Alongside the benefits of SBLE, the importance of telehealth and its role in training the next generation of psychologists is recognized (Simpson et al., 2014), especially given the COVID-19 pandemic. While SBLE can be expensive, it does enhance trainee and client safety (Oberhauser and Dreyer, 2017) through increased opportunity for competency development prior to engaging with true clients.

Although SBLE is emerging in the field of postgraduate psychology training (e.g., Nel, 2010; Edwards et al., 2016), there is limited research in this area (Kühne et al., 2018). In response to this, a scoping review explored barriers and facilitators to using simulated clients in clinical psychology education. Considerations raised in the review included cost, finding people with both acting skills and psychological knowledge, authenticity of portrayal, the importance of careful planning of scenarios, and the effects on actors simulating mental health conditions (Kühne et al., 2018). Traditionally, psychology education has tended to use methods such as clinical placements and written exams rather than SBLE (Sheen et al., 2020); however, SLA are beginning to become more widely considered in postgraduate psychology education and there recent studies testing the efficacy of SLA for psychology trainees.

An interprofessional study involving medical, nursing and clinical psychology students found that knowledge, confidence and attitudes towards clients, professional roles, interprofessional working and intervention approaches improved after working through simulated scenarios and debriefs (Attoe et al., 2019). Students appreciated being able to collaborate with other professionals and reported that the experience had helped them develop better ways of communication, and that they had increased in clinical skills and confidence. Other benefits that they identified were developing empathy, self-awareness and resilience when dealing with clients (Attoe et al., 2019).

Another study assessed the efficacy of a simulation course in helping mental health professionals–including clinical psychologists–work with families and networks of clients with a mental illness (Kowalski et al., 2018). The interprofessional course involved participating in and observing several scenarios, with trained actors portraying clients and members of their network. The results indicated that confidence and attitudes towards tasks associated with the professional role improved after the simulation course. Participants commented on the safety that they felt in the SLA, the opportunity for professional development, and the importance of reflection (Kowalski et al., 2018).

A recent Australian study explored the differences between simulation-based and case-based learning for clinical psychology trainees (Sheen et al., 2020). While trainees in the simulation-based condition rated their confidence higher than those in the case-based condition, their improvements in clinical competence, as assessed in an OSCE, were not significantly different. Qualitative feedback indicated that the trainees preferred the simulation-based option to the case-based option, as they felt the case-based learning did not prepare them for the OSCE (Sheen et al., 2020). However, trainees had concerns about the realism and practical aspects (such as time needed to devote to SLA tasks) of the simulation option.

A study from the United States focused specifically on the use of virtual simulated clients (Washburn et al., 2020). Virtual simulated clients can provide practice scenarios before students begin to interact with real clients, as well as overcoming many of the time and cost concerns of using trained actors. In this study, students in masters' psychology and social work courses were allocated to one of three conditions, with each condition having a different combination of practice opportunities with virtual clients, and assessments with virtual or actor clients. The results after the final assessment indicated that having opportunities to practice clinical assessment with virtual clients increased the students' self-efficacy and diagnostic accuracy (Washburn et al., 2020).

A common assessment method in health professional education is the OSCE, which involves students interacting with simulated clients to demonstrate their clinical skills (Roberts et al., 2020). These have been used for many years in medical education; however, psychology has been slower to adopt OSCEs for assessment, with some recent Australian studies conducted to explore the responses of postgraduate clinical and health psychology students to the OSCE (e.g., Sheen et al., 2015; Roberts et al., 2017; Roberts et al., 2020).

One paper detailed the development of an exam to assess clinical competence, which refers to the ability of students to apply knowledge in practice (Masters et al., 2015). Clinical psychology students completed the exam, which involved observing and conducting a therapy session with a standardized client, and a discussion with the examination committee. Students responded with apprehension and anxiety, although this decreased over time. They also reported growing in confidence and self-efficacy following the exam. The researchers noted challenges in developing the exam, such as finding the right people to play the standardized clients and meeting the time and financial costs (Masters et al., 2015).

In another study, students and staff provided feedback on the OSCEs that were used in three postgraduate psychology units (Sheen et al., 2015). Most students reported feeling positively towards the OSCE, although some noted feeling insufficiently prepared. Students commented on the realism of the OSCE and the ability to put theory into practice. A main disadvantage was feeling stressed going into the OSCE. This student stress has been reported in other research (i.e., Roberts et al., 2017; Roberts et al., 2020). Staff in Sheen et al. (2015) commented that the reliability and validity of the OSCE was higher than for other assessment methods, as well as providing a safe place for students to practice their skills; however, a disadvantage was the increased time and cost required to run the OSCE (Sheen et al., 2015). In response to the limited research on student perceptions of the OSCE, these were assessed in a postgraduate psychology course taken by clinical and health psychology masters students (Roberts et al., 2020). Based on a pilot study (Roberts et al., 2017), the researchers designed a new process for students, which included written and verbal feedback from the simulated client, a mentoring session with a registered psychologist, increased preparation, and the opportunity to reflect on the experience. Overall, students found the OSCE very beneficial for several reasons, including receiving feedback from the client, developing skills and being able to

observe and reflect on their own clinical practice. Some students felt that they did not have enough practice and formative feedback prior to summative OSCE assessment, and some did not like the implemented method of receiving feedback immediately after the OSCE (Roberts et al., 2020).

SLA needs to demonstrate reliability and validity to achieve the desired outcomes for students. Within a study of internet-based cognitive behavioral therapy (CBT) education, a sub-study focused on the actors recruited to be the standardized clients (Edwards et al., 2016). The results indicated that the standardized clients were successful in script adherence and character fidelity. The accurate portrayal of the correct psychological disorder was lower than other aspects, yet still acceptable. The assessment of performance drift indicated that portrayals were consistent over time. The researchers suggest that ongoing performance assessment of standardized clients is a necessary component in SBLE (Edwards et al., 2016).

In conclusion, SBLE has been widely used and researched across a range of disciplines including nursing, medicine, and allied health professions. Use of, and research on, SLA in Australia has emerged more recently in psychology, with a focus on clinical and health psychology. The limited research that has been conducted regarding SLA and professional psychology training has provided evidence that SLA has a variety of benefits to learning, including increased improvements in inter-professional learning, improved empathy, self-awareness, diagnostic accuracy, competence, and student satisfaction and confidence in the area of applied and clinical psychology. Cost and stress involved in preparing for OSCEs have been noted as barriers to carrying out OSCEs in postgraduate studies. Some factors which may mitigate against these barriers include providing written and verbal feedback from the simulated client, mentoring pre- and post-assessment with registered psychologists affiliated with the program, increased time for preparation and provision of formative feedback, and time to reflect on the SLA.

Guidelines for Incorporating Simulated Learning Activities in Professional Psychology Training Standards of Best Practice and Criteria for Simulated Learning Activities

The primary aim of this paper is to provide educators of psychology postgraduate training programs with guidance in the design and implementation of SLA. As previously detailed, SBLE has been widely and successfully utilized in training and assessment across several health-related disciplines. The International Nursing Association for Clinical Simulation and Learning (INASCL) have developed 11 standards of best practice in the design and implementation of SLA (INASCL Standards Committee, 2016). These include key processes to consider such as performing a needs assessment, designing scenarios, having appropriate pre- and de-briefing processes, and pilot testing the SLA before full implementation. These standards provide a useful step-by-step guide for educators considering the varying aspects of implementing SLA in their training programs.

The Association of Standardized Patient Educators (ASPE; Lewis et al., 2017) has also developed standards of best practice relating to the involvement of standardized patients/clients in the SBLE. The standards include a set of core values (safety, quality, professionalism, accountability, and collaboration) and provide guidance across five domains (safe work environment, case development, training of standardized clients, program management, and professional development). The ASPE standards of best practice (Lewis et al., 2017) are intended to be used alongside the standards developed by INSACL (INASCL Standards Committee, 2016). Together, the two documents provide overarching standards of best practice in the design and implementation of SLA within the SBLE. Although originating from the fields of nursing and medical training, these standards are generalizable to the context of professional psychology training.

Another focus of the current paper is to provide consistency within the discipline of psychology regarding the criteria of SLA in a training context. Although the two documents cited above provide broad guidance regarding the design and implementation of SLA, it is useful for educators to develop a specific set of principles to guide their design of specific SLA. This allows educators to determine if a particular SLA fits the commonly adopted criteria of SLA within the context of postgraduate psychology training.

Consequently, we propose criteria for SLA within psychology, based on standards from the INACSL (INASCL Standards Committee, 2016) and ASPE (Lewis et al., 2017). In developing these criteria, we were cognizant that postgraduate psychology training in Australia encompasses a wide range of programs and different applied areas of practice (refer to Australian Psychology Accreditation Council, 2019a Standards; and Kavanagh, 2015 for an indepth coverage of postgraduate psychology training in Australia). As such we developed the principles to be sufficiently flexible to be adapted to different program levels and areas of practice. We propose nine key criteria for what constitutes an SLA within postgraduate psychology training.

Criterion 1: Competency Based
All SLA should be directly linked with the development and/or assessment of specific trainee professional competencies. That is, each SLA should specifically focus on aspects of competencies within the specific psychology training program in which it is introduced.

Criterion 2: Opportunity for New Learning
SLA should be designed to scaffold learning, building on existing skills and knowledge while extending new learning with minimal risk or concern of causing harm. As such, the scope and complexity of SLA should be commensurate with the professional development stage of the trainee and needs to provide opportunity for new learning or an extension of previously acquired skillsets. As such the activity should not be overly simplistic or difficult and should provide an appropriate level of challenge for trainees to develop new learning.

Criterion 3: Parallels Real Life Psychology Practice

The SLA needs to have authenticity, and represent aspects of real professional situations, activities and/or interactions that the trainee will encounter in their psychology careers within their area of practice. These should be realistic and authentically mirror real-world situations and practice in a way that enhances relevance. In other words, the SLA should be ecologically valid in the development of skills, procedures, and knowledge, identification of learning needs, and the assessment of real competencies.

Criterion 4: Trainee Active Participation

SLA should have an emphasis on experiential and active learning principles embedded into the activity–as compared to didactic presentations, passive observation, or rote learning of material. Trainees involved in the SLA should play active and engaged roles, and not simply be observers.

Criterion 5: Structured Processes

The SLA needs to be designed and implemented in a structured and controlled manner, which allows risk to be better contained, and learning to be more targeted. This includes the use of standardized clients and provision of clear instructions to all involved, including the trainee undertaking the SLA, supervisors overseeing the activity and any simulated/standardized clients. The scope, complexity and areas of targeted learning should be clearly presented, ethical considerations of confidentiality, safety, and mechanisms to opt out for the person in the simulated client role. Procedures should be appropriately documented to provide clear instructions in the entire SBLE process.

Criterion 6: Supervised

The implementation of the SLA needs to be supervised by suitably qualified staff able to monitor trainee learning, oversee the appropriate implementation of simulated learning, ensure sufficient safeguards are in place and review the outcome of the activity.

Criterion 7: Reviews and Feedback on Trainee Performance

SLA needs to have inbuilt processes whereby the work of the trainee can be reviewed, even if the SLA does not constitute a formal assessment component of their training. As such, the activity may require the use of audio-visual recording and/or suitably qualified reviewers to be present during SLA. Training protocols and assessment guidelines should also be available for reviewers to provide a standardized assessment process. Trainees should be provided with feedback regarding their performance, which can be either summative or formative in nature. Within a structured SLA, feedback should also be structured, allowing clear linkage to the development of competencies.

Criterion 8: Opportunity for Trainee Reflection

The SLA should cause trainees to explicitly reflect on their experience and learning within the SLA, including the extent to which this material relates to the development of their professional competencies. Trainees should also be encouraged to provide balanced reflection that includes both areas of strength and areas of improvement, and how their learning can inform their future practice.

Criterion 9: Opportunity for Stakeholder Feedback

The SLA should also have feedback mechanisms for all stakeholders, including program authority, supervisors, assessors, simulated/standardized clients, and trainees. The feedback process allows for ongoing adjustments and improvements to be made so that the SLA remains fit for purpose.

Ethical Considerations

SLA are designed to replicate psychological practice; however, the use of SLA in professional psychology training raises some unique ethical issues relative to other learning activities. A key difference between a simulated and real psychological practice experience is that, for the most part, in professional psychological practice ethical considerations prioritize public safety and the client. In contrast, while the goal may be to ensure students are competent to work safely and ethically in the real practice setting, in SLA academics have an ethical responsibility to both consider and protect the psychological safety of students participating in the SLA and the integrity of the learning activity. This is especially the case where SLA involve student dyad role-plays of therapist and client.

Ethical psychological practice principles must guide all stages of an SLA, including at the design, implementation, and review phases, and consider all parties involved. Considering the needs of students who may be personally activated (i.e., distressed) by the SLA themes is integral to safe and ethical simulation design, and provides for proactive support and management of such situations prior to engaging in client work where such activation may also occur. All those involved in an SLA have both separate and overlapping responsibilities (detailed below) and these should be understood by all parties.

Academic Staff Responsibilities

The responsibility of academic staff is in developing and setting up the guidelines and parameters for the SLA (including guidelines designed to prioritize student safety first and student competency-based learning second), develop comprehensive scenarios plays for suitable SLA, including role-plays, and to ensure a framework for student safety is in place. These frameworks and guidelines should span issues including the nature and expectations of the various roles in SLA (e.g., what is the role of the therapist, the client, and the supervisor in a simulation?), as well as ensuring there are clear protocols on ensuring confidentiality and safety, especially if the person in the client role shares lived experiences. Protocols for responding to both "clients" and "therapists" who struggle or become distressed during the SLA should include an opt-out process. Note that the academic may also be the clinical supervisor.

Clinical Supervisor

The responsibility of the clinical supervisor is to support the learning experience of the student-peers and apply the principles

TABLE 2 | Ethical considerations and practical suggestions for employing ethical psychological practice principles at each phase of the SLA.

Ethical considerations	Practical suggestions
Entry into postgraduate study	
A key consideration for potential postgraduate students (as trainee psychologists), is awareness of the requirement of training programs to balance the safety of students in learning, with the safety of the public as clients. This may be particularly salient when using SLA to prepare students for safe and competent psychological practice	• Inform students that the course involves learning activities and/or assessments that involve simulations, which for some students may be challenging and activate personal issues. This may be experienced as uncomfortable or distressing but, in preparation for psychological practice with the public, there is an expectation that the student will learn to manage this experience in a way that is safe and ethical, including being open to seeking appropriate support if required
Psychologist educators ought to consider issues of fidelity and responsibility to inform potential students of the nature and expectations of training they may undertake (e.g., A.3) to develop competence in professional practice (e.g., B.1; B.3) and recognize when their professional functioning may be impaired (B.1.4)	
Design phase	
Consider the aim of the SLA and how and what type of SLA may serve to best develop psychological practice competencies. This would include consideration of optimal learning design (beneficence) that minimizes risk of harm to students and de-stigmatizes perceptions of clients (e.g., non-maleficence, respect, responsibility) For example: • Demonstrating respect for both student and clients - for example in simulation content (e.g., A.2.1) • Informed consent for participating in SLA (A.3.3) • Privacy (A.4) and confidentiality regarding any personal material that may arise (A.5) or where information is recorded, including for assessment (A.5.1) • Linking explicitly to developing competence including engaging in supervision and reflective practice (B.1) • Professional responsibility to prevent and address harm (B.3) including the use of trauma informed approaches in addressing potential risk and vulnerability relevant to students' histories	• Supervisors to have relevant experience (e.g., as psychologists and/or educators) in designing SLA as a teaching or assessment tool • Design and provide a clear rationale and informed consent process for who plays the client role (e.g., supervisor, actor, another student). Make opt-out option explicit in informed consent, however, consider opt-out requests on an individual basis in consultation with the student • If the client role is played by a student, ensure there is always a clear case study available to be used as the basis for the SLA (either provided or developed by students) • Acknowledge that SLA may at times lead to inclusion of real-life experience particularly with novice trainees in the client role who do not have clinical experience to draw from. Provide clear directions to all involved parties ("clients," "therapists," and supervisors/educators) about what to do to ensure ethical psychological practice principles are adhered to • A clear process for student consent, for both client and therapist role. Specifically, if the issues brought up in the SLA are activating student's personal issues, lead to distress, and cannot be tolerated by the student, steps need to be outlined that allow any party to slow down or cease the role play, an option to change case scenario content or move from personal experience to case study, or to opt-out for student safety • Informed consent procedures and, where it does not compromise development of competencies for safe practice, an opt-out option or appropriate safe alternative for experiential learning. This may also include the option for students to raise concerns with the academic before conducting SLA • Ensure there are a sufficient number and appropriately qualified staff available to support the SLA (including, for example, Board Approved supervision status) • Address different ethical considerations as relevant to different SBLE purposes (e.g., assessment vs. non-assessment simulation; formative vs. summative) • Consider the composition of student dyads or groups with respect to scaffolded learning and authentic novelty (i.e., the impact of familiarity and trust on safe learning vs. the need for reduced familiarity to prepare for client contact) • If applicable, develop a policy for the use, storage, and disposing of student SLA recordings • Develop a suitable framework for students to engage in reflective practice, to provide structured summative and/or formative feedback, and to provide feedback about the learning experience to educators
Implementation phase	
Prior to the simulation Ensure the SLA occurs in a safe learning environment, that students are aware of their responsibilities and that the SLA facilitates students' developing psychological practice competencies. For example, in line with previous considerations, this would include an explicit reminder of aspects of the SLA pertinent to professional responsibility to prevent harm (B.3), informed consent (A.3), confidentiality (A.5). Where students act as "clients", prioritizing that the purpose of SLA is for learning to develop competence (B.1), rather than for therapeutic benefit	• Recognize that SLA, like psychological practice, may sometimes activate personal vulnerabilities which can be amplified in evaluative environments. Where this is observed and may impact on psychological practice, this may need to be raised within individual supervision environments to support safe practice with clients • Provide a reminder of the safety instructions and that the supervisor of the SLA is ultimately responsible for monitoring the safety of all parties and is available to intervene or support as required • Supervisors to equip students with strategies to manage their own and others' affective responses (including distress) during or after SLA

(Continued on following page)

TABLE 2 | (*Continued*) Ethical considerations and practical suggestions for employing ethical psychological practice principles at each phase of the SLA.

Ethical considerations	Practical suggestions
	• Remind students of strategies and processes for dealing with difficult SLA experiences • Provide appropriate modelling of ethical behavior in organizing the learning environment and communicating about the SLA in a way that demonstrates the nature of safe and ethical practice that is expected of students with clients. Consider the inclusion of expert demonstration (staff *in-vivo* or video resource) before student simulation • Remind students of confidentiality as aligned with therapeutic practice • Remind students that first and foremost this is a learning experience for themselves and their peers and that although being in a client role may be therapeutic, this is not the intention of the SLA • Give students detailed case materials that they can become familiar with, ideally prior to the SLA • Where relevant, schedule in time for pauses and breaks that gives students structured opportunity to regulate their reactions and responses SLA material and encourage student autonomy by identifying ways for them to manage their responses, and raise reactions with colleagues and supervisors as appropriate
Beginning the simulation activity	
Setting up the context and environment for SLA is underscored in particular by issues of professional responsibility (B.3) that should be recognized and addressed by educators and where relevant those simulating client and/or therapist. Focus students on the aim of the SLA, remind them of the ethical issues that support simulation as a learning exercise, and emphasize the policies and processes which are designed to ensure a safe SLA experience for all	• Remind students of safety protocols and ethical issues, including boundaries of confidentiality and options for when acting as client begins to compromise a safe learning environment • Negotiate with the student/actor/staff member playing the client role how they can indicate they would like a break or to opt-out of the simulated role play • Remind students that they are to seek advice from supervisors/academics who are responsible for the safety of students/actors in the SLA. For example, if the client continues to be distressed (despite the student therapist checking in and asking if they want a break), the supervisor will pause the SLA and make a time to discuss options that balance student/actor safety with the development of competencies relevant to safe and effective practice with clients
During the simulation	
To ensure professional responsibility (B.3), supervisors/educators to have strategies in place to manage student affective responses in response to SLA.	• Ensure access to supervisors during the SLA (on-site or available to be contacted) • If the client becomes distressed and this continues despite student therapist's efforts to address and support, supervisors are available to pause, debrief and provide support • Supervisors are to remain aware of their professional role in relation to trainees engaged in SLA, and as such only provide support appropriate to that role. Where indicated, onward referral for counselling support should be offered, in keeping with duty of care requirements and the limits of supervisory responsibilities
Review phase	
After the simulation Students are provided opportunities to self-reflect and evaluate their: 1) learning experience; 2) competency development; 3) general experience of the SLA (positive, neutral, and difficult); 4) quality of feedback (formative and/or summative); and 5) quality of supervision. This supports the development of competence (B.1) in trainees, as well as for educators/supervisors in relation to the design and implementation of SLA. Distress in students elicited by the SLA material will be managed both in supervision and following the usual guidelines for managing student distress	• Build in sufficient time for students to reflect on the SLA using a guided or structured reflective process, especially with those students early in their professional training. This should be focused on development of skills and competencies, rather than on private experiences • Ensure students have the opportunity to discuss their SLA within an individual supervision environment if desired • In summative SLA, supervisors to provide time for feedback and to invite student therapists to comment on what they would have demonstrated more of, if time (with relevant allocation of marks towards their final grade) • Make clear how students can provide feedback to instructors about the SLA.

Note: Letters and numbers in parenthesis (e.g., A.3, B.1) refer to specific sections in the Australian Psychological Society (2007) Code of Ethics.

of ethical psychological practice during the SLA, including boundary setting clear and transparent processes for the roles of all parties should be established prior to the commencement of the simulation. Supervisors are also responsible for the safe practice of student SLA, to intervene (if the therapist has not already) during the SLA to ensure safety of the client, to debrief with the client and therapist before feedback/reflective practice. Supervisors need to model ethical conduct in the design and delivery of SLA.

Simulated Client's Responsibilities

The role and responsibility of the simulated client is to support the learning experience of their student-peers and apply the principles of ethical psychological practice principles during the SLA, including boundary setting. Specifically, simulated clients need to be aware of personal boundaries, refrain from choosing client issues that may represent their own personal issues and conflicts, and to choose the issues that will also support the student-therapist's learning experience.

Simulated Therapist's Responsibilities

The simulated therapist is responsible for engaging in the SLA in a professional manner consistent with that employed when working with "true clients," including application of ethical psychological practice principles. They are also responsible for responding appropriately if the client is struggling with the simulation, which may involve terminating the simulation and providing access to supports. The simulated therapist is also responsible for prioritizing the simulated client's safety through the SLA.

Ethical SLA design serves as a powerful teaching tool for ethical psychological practice. **Table 2** highlights key ethical considerations relevant to the design, implementation, and review phases of the SLA. Note that the table provides a non-exhaustive list of considerations and recommendations, and references to sections of the Australian Psychological Society (APS) Code of Ethics [the Code] (Australian Psychological Society, 2007) are in parentheses. The table focuses on the Code to provide examples, but there are many Ethical Guidelines which would also be of relevance.

Examples of Implementation of SBLE

Throughout the course of 2020, tertiary education providers of postgraduate psychology training courses were invited to take part in regular national meetings to discuss and address common issues resulting from the impact of COVID-19 on student training. As part of the discussions about the use of SLA in this context, teaching staff involved in postgraduate psychology training were invited to provide information about the SLA they already use as well as their experiences on the use of SLA. Examples of simulations were offered from 17 providers of postgraduate psychology training courses. All contributors were asked if they would like to be acknowledged in any materials developed from their contributions; the names of the contributors outside of APPESWG are listed in the acknowledgements section.

Based on the examples provided, we propose that SLA may be particularly beneficial in the early phases of postgraduate

psychology training, commonly in role-play with other students, with an emphasis on preparatory skills development and competency demonstration in advance of service delivery to members of the public. These examples (below) describe a range of activities relevant to SLA which may have different purposes, although may occur within the same SLA.

Simulation Observation

Trainees observe simulations of psychological practice, which can be live (e.g., lecturer demonstrations or role plays) or virtual. To encourage active learning, students may be encouraged to incorporate the observed material into skill relevant practice such as case formulation and treatment planning and write a reflection or engage in peer supervision to discuss the observations made.

Experiential Client Perspective

Trainees engage in a simulated client experience. This may include learning a client role based on details from a case study (typically for a role-play), or it may be an immersive experience intended to build empathy and perspective taking. While there is less emphasis on the client role in simulations, SLA can also be structured to enhance competency development when adopting the client perspective. See **Table 3** for examples of experiential client perspectives embedded within postgraduate psychology training in Australia.

Structured Skills Practice

These SLA provide an opportunity for training and skills rehearsal, typically in the format of role plays with student peers. Structured case-based learning is still used, with the client role informed by material from existing clients, ensuring case materials are deidentified to ensure confidentiality, or with constructed case details that are provided to students. Where appropriate, variability and flexibility allow students to learn and experiment safely in the therapist role. Feedback is formative, reflective practice often embedded, and may include structured review within formal supervision sessions. It may also build towards a competency based summative assessment. See **Table 4** for examples of structured skills practice currently employed across postgraduate psychology programs in Australia.

Competency Demonstrations

These SLA are summative assessments of competency, including across the domains of ethical practice, psychological assessment, and therapy identified above, and often designed to replicate the practitioner experience as authentically as possible. They tend to be more structured and standardized to ensure fairness of assessment across trainees and commonly used as gatekeeper tasks to ensure safe and competent practice before service delivery to the public, with student resubmissions if competency is not met. Formal feedback is embedded and may also include reflective practice components. See **Table 5** for examples of competency demonstrations currently used in Australian postgraduate psychology training programs.

SLA currently in use differ according to the intended learning outcomes, resources, and purpose of courses and programs of

TABLE 3 | Examples of experiential client perspectives.

Trainee demonstrates knowledge of client experience through construction of case scenario (e.g., diagnostic criteria, comorbidities, typical client presentations), on which feedback is provided. Trainee then role-plays content from the case scenario for others in skills practice

Trainee engages in simulated client experience (e.g., hearing voices) using reflective practice to enhance tailored treatment delivery when working with true clients presenting with such issues in the future

Trainee researches client presentations and then completes psychological measures and structured assessments in client role to demonstrate understanding of client presentation and measurement, and enhance empathic responses when administering, interpreting, and providing feedback to true clients who complete such measures in the future

TABLE 4 | A summary of methods for structured skills practice.

Category	Examples of currently used variations in simulations
Competency domain	• Ethics (e.g., confidentiality, informed consent), and risk management • Psychometric Assessment (e.g., WISC/WAIS; scale administration) • Assessment (e.g., initial interview, MSE, structured interviews, observation) • Therapeutic intervention skills
Case details	• Pre-developed case scenario • Based on referral data • Dynamically constructed by students in real time
Client role	• Peer students (same cohort) • Different cohort role-play to others (e.g., novice vs. advanced students) • Trained actors • Alumni • Virtual simulation • Staff members including clinical supervisors
Observation	• Role plays observed live in person • Remotely *via* video • Video recorded for review in supervision
Feedback and Review (formative)	• Structured peer feedback processes (e.g., administration checklists) • Opportunities for reflection (varies in structure) • Formal supervision (group or individual)

study; however, the key methods currently in use are summarized below (**Table 4**) in relation to the most common purposes of skill development and competency demonstration (**Table 5**) and may provide ideas for future SLA design.

POTENTIAL ISSUES IN IMPLEMENTATION OF SLA

While there are clear benefits of SLA, the proposed increased integration of SLA as defined by these guidelines in postgraduate psychology training is not without controversy, with some understandable reservations held by trainers and trainees alike. The subsequent section attempts to directly respond to the key issues typically expressed about the use of formalized SLA in postgraduate psychology training programs. Discussion is based on evidence and best practice outlined in these guidelines, the views of Australian professional psychology trainers consulted regarding their experience of simulations as part of the national initiative, and a survey of students participating in postgraduate psychology training programs, conducted by members of APPESWG. This student survey sought to understand students' attitudes towards the use of SBL in postgraduate

psychology training programs. It comprised responses from 84 students (71 female, 13 male) enrolled in Master of Psychology programs with most in their fifth year of training (APAC Level 3) from across all Australian states and territories. Students were undertaking training in five different areas of psychology with most participants completing a Master of Professional Psychology (APAC Level 3) or a Master of Clinical Psychology (APAC Level 4 AoPE) (Oxlad et al., 2020).

The Worth of SLA

Effective SLA require a lot of work and educators and students are often already overloaded, so the question arises "Are SLA activities really worth it?." Using best practice guidelines in the design, implementation, and assessment of SLA does require additional work by educators–as does any new assessment process. It was an objective of APPESWG to improve the training of postgraduate psychology students and reduce the burden on individual educators when devising innovative training and assessment processes. To do so, this paper provides benchmarked guidelines for best practice in SLA.

There is empirical evidence to suggest that SLA can increase student competency and confidence, resulting in better performance on placement and better breadth of experience

TABLE 5 | A summary of methods for competency demonstrations.

Category	Examples of currently used variations in simulations
Competency domain	• Initial informed consent process • Risk assessment and response • Psychometric Assessment (e.g., WISC/WAIS; scale administration) • Assessment (e.g., initial interview, MSE, observation) • Therapeutic intervention skills
Case details	• Pre-developed case scenario–detailed instructions and training • Existing referral allocated to student
Client role	• Students–with clear guidance and instruction • Trained actors • Staff members with sufficient experience
Observation	• In person (e.g., viva) • Remotely *via* video (also includes telehealth) • Video recorded for formal assessment submission
Feedback and Review (summative)	• Structured rubrics used to provide feedback • Individual assessment of competency undertaken by qualified examiners (e.g., OSCE) • Structured reflective practice process

particularly with low frequency high risk situations (Roberts et al., 2017). This accords with the views offered by educators from Australian postgraduate psychology training programs to the national initiative, highlighting that positive feedback is often received from both the student performing the role of client and the student performing the role of the therapist in the context of SLA activities. This feedback is especially likely if SLA are well designed and implemented, consistent with the principles outlined above, as opposed to adoption on a more an ad-hoc basis.

Students surveyed about their experiences of SBLE reported that they felt SLA to be valid way to develop assessment and intervention skills, to "ease into" client work and to enhance competency. Both empirical and anecdotal evidence therefore suggests that simulation-based client work not only instils confidence in trainee psychologists but that this can translate into competency attainment, safely and effectively, before trainees enter placements, which is a universal goal of early professional psychology training. From this perspective SLA are likely to be "worth it" in supporting students to develop required competencies for client work and ensuring protection of the public.

A final issue for consideration highlighted through our consultation of postgraduate psychology educators was whether institutions would commit to adequate resourcing of SLA, especially when used in the context of formative assessment for the development of specific professional competencies (i.e., separate from trainee placements). Example concerns included costs associated with the use of actors and examiners in the context of OSCEs. These issues relating to individual institutional support for SLA activities, while recognized as important potential barriers to more widespread use of SLA, are beyond the scope of this document and thus included as a topic for future inquiry and consideration.

How to Fit SLA into Already Full Curricula

Professional psychology training program curricula are already full, which leads to the concern and question of "how can we fit it in?" Integrating SLA into pre-existing postgraduate psychology

training program curricula can be challenging and ideally will occur as part of a broader curriculum review. The best way to achieve SLA integration within postgraduate training programs will depend on the structure and resourcing at different institutions. Some helpful considerations in this paper include the overview of different modes of SLA (e.g., virtual, trained actors, role plays) and examples of different SLA. These modes and examples will aid in selecting the best fit between SLA and institutional needs when considering how to add the benefits of SLA to existing course loads.

Managing Student Apprehension Toward Training and Assessment Approaches

The increasing focus on the students' experiences in postgraduate psychology training programs leads to the question of "how can we manage student apprehension towards training and assessment approaches?" Students commonly respond with apprehension to changes to their training programs where they perceive they must undertake something new or additional; however, in a recent survey of student perceptions of SLA, students responded favorably when asked whether increased use of SLA would be beneficial. Students perceived the benefits of SLA to include providing an opportunity to learn and apply skills in a safe environment and receive feedback where they were not placing the public at risk. SLA also provided them with a means with which to enhance their confidence in such skills. While some students indicated no drawbacks to the increased use of SLA, others raised concerns such as SLA being stressful, increased workload, and whether it would take away time from actual client work. Despite such concerns, most students reported many potential benefits. Indeed, students noted that when it comes to additional SLA, they would value the opportunity to further apply their skills and integrate their learning into practice, to be exposed to diverse client presentations, and to receive feedback about their performance from multiple sources, which is consistent with our proposal of best practice guidelines for SLA. Postgraduate programs educators noted that in their experience, while students may

initially perceive SLA as not as beneficial as real-life client work, this attitude changes very quickly when they experience the value and benefits, and enjoy the freedom to learn the paradigms afforded them. Emphasizing these aspects of SLA when presenting these activities to students (i.e., scaffolding learning activities) is recommended, as well as explicitly and pre-emptively addressing the concerns students may typically hold about SLA.

Providing Realistic Learning Experiences and Ethical and Safe SBLE/SLA

There are several approaches to SLA, utilizing different models for the identity of the client (e.g., known peer from same institution, unknown peer from same institution, cross institution collaborations, virtual client, actor as client, etc.), as well as the nature of case characterization (e.g., embellished vs. real life), with a view to promoting a safe but realistic opportunity for SBLE.

Supporting Effective Client Portrayals to Maximize Student Learning Experiences

Important considerations when setting up SLA include ensuring that the person acting as the client can sustain a realistic and logically consistent characterization for the duration of the SLA, while also balancing this with understandable concerns for student/actor safety. To achieve the best results, it is essential that SLA are structured processes that employ the use of standardized clients, that clear instructions and training have been provided, and that supervisors oversee the standardized clients and the activity. Both educator feedback and the trainee survey also highlight the importance of SLA being planned and structured to maximize learning potential so that trainees can mentally prepare in advance. This is as true for the client as it is for the therapist. In fact, feedback received by educators from trainees indicates that trainees acting in the role of client are often surprised at how much they learn by researching their own case with a view to presenting as authentically as possible in their role of the client. By increasing focus on this aspect of SLA activities, it is possible that not only is therapist skill development supported, but also students' understanding of psychopathology and different client presentations.

Some interesting insights, specific to the use of known peers as clients in SLA, from the trainee survey (Oxlad et al., 2020) are worth noting. For example, some trainees may find it difficult to approach a peer to work with for the purposes of engaging in SLA, where pairs are not assigned a priori by educators. Others may struggle to demonstrate the same degree of motivation and commitment to engage in SLA, placing their paired peer in a difficult situation that may ultimately inhibit their capacity to derive full benefit from these activities. Trainees also expressed concerns that when portraying the client their peer may inadvertently make the cases easier or more difficult than necessary, for example, by divulging too much or too little information. As such, SLA may achieve better outcomes when, consistent with the principles outlined in the guidelines for best-practice SLA, educators provide adequate training and

instructions for those acting as client and embed monitoring mechanisms and supervisory oversight into SLA. Similarly, it may be important to assign client/therapist pairs. Another perspective is that such challenges may also present an opportunity to practice assertiveness skills and ethical practice such as discussing concerns regarding practice/behavior with and about a peer.

Variation in Efficacy of SLA Across Competency Domains

One of the benefits of SLA is that they can be tailored to address areas of underdeveloped competencies in postgraduate psychology trainees. Whether or not these activities convey differential advantages for specific competency domains is yet to be explored and thus discussed in areas for future consideration in research.

Standardizing SLA

Some educators might ask "is SLA really that different from what we already do?." While the concept of SBLE is not new, what this paper sets out to establish are a number of features and guidelines for best-practice SLA, with benchmarking across postgraduate psychology programs and institutions. To our knowledge, this has not yet been attempted in the field of postgraduate psychology training programs, either in Australia, or internationally.

Competency Development

In the context of developing competencies, the question could be posed that if trainees are struggling to develop their competence in a specific area, are they not better having more actual client work experience than simulated client experience? Underscoring the rationale and evidence for the integration of SLA in postgraduate psychology training, as outlined earlier in this paper is the notion that such paradigms afford trainees the opportunity to cultivate competencies in a safe and scaffolded manner before transferring these skills to real-life client work. Consistent with the concerns raised by both educators and trainees through our work, we agree that SLA should not take away from a trainee's opportunity for real-life client work. However, we would argue where a trainee has been identified as lagging in specific competency development, these remedial needs are best nurtured and assessed in the context of SLA, with criteria for satisfactory performance able to be standardized across trainees. In this way, simulated client experience is a more appropriate safe first step in a trainee developing the minimal requisite skills to work with real-life clients, as opposed to a substitute for actual client work. This affords not only protections to the trainee and supervisor, but also upholds the interests of public safety.

Guidelines for the Assessment of SLA

We understand that educators and trainees alike share reservations about the way in which SLA are best assessed, and how this feedback might be used to inform trainee competency development, including implications for evaluations in which trainee performance is deemed to not

meet competency based on SLA. These concerns are addressed in these guidelines.

Contribution of SLA to Direct Client Hours Accrual

The issue of whether SLA should contribute to and how many hours can be counted as direct client hours as defined by the Australian Psychology Accreditation Council (APAC; Australian Psychology Accreditation Council, 2019a) is an important consideration. Currently SLA is allowed for Level 3 APAC accredited masters programs and we recommend this to also be considered for Level 4 APAC accredited courses as well.

FUTURE DIRECTIONS

Recognition of Simulation-Based Learning and Education by Accrediting Bodies

As already articulated throughout this paper, SBLE research demonstrates that well designed SLA are not an inferior substitute to placements. SBLE presents numerous benefits including enhanced training in typical and atypical client presentations, improvements in trainee engagement and confidence, and more authentic formative and summative assessments of competencies. We expect that greater use of SLA that comply with our guidelines will lead to improvements in public safety, the trainee experience, and attainment of competencies. These guidelines can also serve as a standardized protocol for future SBLE research. We therefore recommend greater recognition of SLA as an integral part of postgraduate psychology training by relevant accrediting bodies (i.e., APAC).

At this point in time, the guidelines have been endorsed by the Heads of Departments and Schools of Psychology Association (HODSPA) in Australia, to be circulated to postgraduate psychology training program staff. Representatives of APPESWG are also preparing to make a submission to APAC for their consideration of the guidelines. The typical process by APAC for making changes to standards and guidelines is engaging in stakeholder consultation (e.g., education providers, professional associations) on their proposed modifications–a top-down approach. Given that over one third of the postgraduate psychology training providers of APAC Level 3 and 4 qualifications contributed to the guidelines, APPESWG is hoping that a ground up approach of stakeholders presenting recommendations, may facilitate the incorporation of the SLA and SBLE guidelines and recommendation in to APAC's standards and guidelines in a timelier fashion (i.e., months not years).

Future pandemics and other crises are possible, if not likely, as in between inception of this process and final publication, parts of Australia have experienced some of the harshest lockdowns in the world, with currently 18 million people (72% of the population) in another snap lockdown as of June 2021. Therefore, SBLE approaches are necessary to avoid deficits in trainee client contact hours, development of competencies, and in the mental health workforce that would otherwise occur due to inaccessibility or limited availability of external placement opportunities.

Collaboration Across Universities

The benefits of SBLE are contingent on the quality, reliability, and validity of simulations. Thus, the primary purpose of this document is to present guidelines for best practice in SBLE, which we hope will provide consistency in SBLE standards in postgraduate psychology training. We acknowledge that these standards will require a degree of institutional support from tertiary education providers; likely be contingent on the development and implementation of standardized evaluation frameworks showing that SLA are not only highly effective for learning but can be conducted in a safe and ethical way. Consistency in SBLE standards across universities will therefore require greater collaboration across providers. Cross-institutional collaboration will mean better benchmarking, more SBLE research, and the sharing of SLA resources and costs (e.g., training of simulated clients and educators, and the development of simulation material). Cross-institutional collaboration will also see SBLE becoming a standardized approach with graduates across different programs having similar knowledge and skills.

Research

Although the evidence base for the use of SBLE is strong in other disciplines, such as medicine, there is much less research into SBLE in psychology training. To date, most SBLE studies in psychology have been qualitative and as such, more research, including quantitative and mixed methods, is needed to support our assertion that SLA are important additions and preparatory adjuncts to traditional training methods such as placements. We therefore recommend a program of research beginning with pilot studies that compare programs with and without SBLE to examine whether SLA led to improvements in the trainee experience and learning outcomes. This can then be followed by cross-institutional trials that examine the efficacy of SLA that comply with our guidelines. Longitudinal studies to examine the predictive validity of simulations and research examining the reliability and validity of SLA when used in summative assessments are also required. Whether or not SLA convey differential advantages for the development of certain competency domains over others may also be of interest to trainers with a view to better targeting the investment of institutional resources. Finally, as new technologies such as virtual reality and augmented reality become more affordable and accessible, further research into their use in SLA might lead to improvements in standardization and authenticity of simulations.

CONCLUSION

SLBE is an essential training method that has been demonstrated to scaffold clinical competency whilst ensuring public safety. It also provides an additional training option in the response to various challenges in the placement context including but not limited to, restrictions in the context of a global pandemic such as COVID-19, as well as low prevalence presentations that trainees may not come across in their placement settings. SLBE provides

an authentic and controlled learning environment and this paper provides clear evidence as well as guidelines for its inclusion in postgraduate psychology training programs.

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Learning Effectiveness of Social Work Methods With Groups, in Online and Face-to-Face Contexts

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During the last three decades, thousands of highly qualified social workers who graduated from Romanian universities were employed in the public systems of social work of the European Union. Social group work is studied as a compulsory discipline for undergraduate students. The major focus of our study was the effectiveness of the learning of Social Work Methods with Groups (SWMG) of students, using workshops in a full-time undergraduate program from Romania. We were interested in finding out the perceptions of students about their learning processes and outcomes in the context of teaching the same discipline exclusively in the online medium, due to the pandemic, and in the face-to-face environment *via* traditional classroom instruction. This study had a mainly quantitative design, covering two academic years between 2018 and 2020 for the two cohorts of social work students. The core analysis was focused on the activities of students at the SWMG laboratories: 50 students in 2020 and 92 students in 2019. Descriptive, inferential statistics and thematic content analysis were applied to two types of deliverables of students: the self-assessment sheet and the group plan. The results of our study showed that training of cognitive and self-awareness skills prevailed among the students who learned online in 2020, while the acquisition of interpersonal skills was reported at a significantly higher level by students who learned in the face-to-face medium in 2019. The students in the traditional classrooms favoured the training of other professional skills, too, like problem-solving skills. However, students who studied exclusively online attributed a significantly greater overall usefulness of SWMG workshops for professional practise than their peers who participated in the face-to-face laboratories. A remarkable result was that more therapeutic and support groups were preferred in the online environment, maybe related to the concerns generated by the pandemic. Remote education forced most students to return to their original places of residence, mostly in the countryside and brought negative psychological effects caused by social isolation due to the pandemic. Remote learning is not the most desirable educational option. Students gain most from blended teaching-learning vehicles: face-to-face and online medium.

Keywords: effectiveness of online learning, social group work, ecological influence on groups, online vs. face-to-face groups, Romanian students, social work competencies

MAIN THEMES OF THE ARTICLE

(1) Higher Education (HE) Delivery: Challenges of emergency remote teaching: (1) technology and remote delivery; and (2) assessment limitations arising from online formats.

(2) Reflections on the Past and into the Future: What will be the "new normal" in HE? What values, vulnerabilities, priorities, and opportunities have been revealed in the crisis and our varied responses, realigning relations between teaching, research, and service internationalisation.

INTRODUCTION

Our study was motivated by the new challenges and opportunities from higher social work education created in the context of the COVID-19 pandemic. The prolongation of the COVID 19 crisis forced our university to reconsider the way we approach the teaching-assessment process. To not compromise the quality of the educational act, we needed an *ad hoc* reconceptualisation of the teaching–learning–evaluation activities. More precisely, in this new context, developing and implementing novel teaching strategies was necessary. They capitalise on the strengths and good practises extracted from classical teaching, which were adapted to the constraints of online education.

The relocated teaching during the state of emergency, determined by the pandemic, was overcome through meeting the quality standards of updated digitised teaching. More precisely, an optimised teaching strategy, namely a so-called interactive online teaching, was proposed. This approach highlights the key role of student interactions (interactions with informational content with teachers and colleagues, respectively) and will formulate concrete suggestions on optimising these interactions.

These types of interaction are the essence of student-centred teaching. The focus was mainly on those technological features that superiorly favour the use of strategies and teaching methods that increase the quality of teaching-learning. The elements that individualise this didactic paradigm are synthetically exposed in the following, highlighting innovative elements: (a) from a psycho-pedagogical perspective, it is based on social-constructivist conceptualisation; (b) it assimilates actively and selectively the requirements of online education; (c) it promotes flexibility regarding the sharing and alternation of synchronous and asynchronous activities; and (d) it explicitly focuses on teaching strategies that increase the level of student interaction with informational content and, respectively, the interactions of students with teachers and colleagues.

The designed solutions optimised both didactic versions that Babeş-Bolyai University has undertaken for the first and, respectively, for the second semester of the academic year, during the pandemic: predominantly or exclusively online and, respectively, hybrid or blended learning.

This redesign of instructional tactics at the university level focused on all key components of educational acts and, respectively, of the context in which they occur: teaching, assessment, feedback, learning community, educational climate,

and issues related to persistence and the motivation students for learning.

In the specific context presented above, we were particularly concerned about the effectiveness of learning Social Work Methods with Groups (SWMG) among students, using workshops in an undergraduate program from the Romanian university where we are employed as teaching professionals. More specifically, we were interested in finding out the perspectives of students about their learning processes and outcomes in the context of teaching the same discipline in the online medium, mediated by technology (in the 2020 cohort), and face-to-face *via* traditional classroom instruction (in the 2019 cohort). SWMG is a special compulsory discipline for undergraduate students in the second year of study, scheduled with 2 h of coursework and 2 h of workshops per week for 14 weeks. The learning objectives of SWMG for students were to acquire a set of knowledge, values, and skills to work with groups, to understand the main concepts and theoretical approaches regarding the use of groups in social work, to know and practise the main skills needed in working with groups, and to understand the particularities of working with different categories of beneficiaries of social work within groups. Developing social work practise competencies is complex and requires a combination of procedural competencies such as knowledge and skills, along with meta-competencies such as self-awareness and self-reflection (Kourgiantakis et al., 2020).

The theoretical and empirical frameworks on which we have based our research included: ways to define groups (Sampson and Marthas, 1981); concepts, values and skills in working with groups (Sampson and Marthas, 1981; Doel, 2006; Brandler and Roman, 2016); ecological influence on groups and group practise (Vinter and Galinsky, 1985; Tropman, 2004); types of groups by purpose: recreational groups, educational groups, support and self-help groups, socialisation groups, therapeutic groups and prevention groups (Kurtz, 2004; Nash and Snyder, 2004; Roffman, 2004; Zastrow, 2015; Toseland and Rivas, 2017); group dynamics (De Visscher and Neculau, 2001; Toseland et al., 2004); goals and stages of group development (Tuckman, 1963; Garland et al., 1976; De Visscher and Neculau, 2001; Shulman, 2016); tasks, roles, leadership and power within groups (Doel, 2006); online groups, virtual classroom and online support, online/technology-mediated teaching and learning (Gitterman and Salmon, 2009). The core of the *group work model* taught in the classroom was *the mutual aid model of social group work.* The main characteristics of this model have presented in the Schwartz (1961) definition of the social workgroup as: "an enterprise in mutual aid, an alliance of individuals who need each other, in varying degrees, to work on certain common problems. The important fact is that this is a helping system in which the clients need each other as well as the worker. This need to use each other to create not one but many helping relationships is a vital ingredient of the group process and constituted a common need over and above the specific task for which the group was formed" (p. 19). And more specifically the teaching and learning was focused on *group work approaches related to purpose*: support groups, educational groups, growth groups, therapy groups, socialisation groups, self-help groups, and prevention groups.

As a *pedagogical strategy* underlying the teaching model, we have used the service-learning/community-related service-learning framework. *Service-learning* is an innovative pedagogy that intertwines community service with the main objectives of a course from a reflective perspective, where the three stakeholders—students, faculty facilitators, and community members—engage in a mutual learning environment (Salam et al., 2017). In the triad mentioned above, community members represent the service recipient, faculty instructors perform as facilitators, organisers, and coordinators between the academic institution and the local communities, and students are engaged in service-learning experiences as service providers and learners (Salam et al., 2019, p. 585).

Higher education institutions can contribute to the development of local communities through collaboration with other organisations (Salam et al., 2019), including institutions and non-government organisations (NGOs) from the social work field. This organisational alliance "provides cognitive and psychological support" for different categories of vulnerable people and addresses different community problems: "Developing a program to help women re-enter the workforce; studying the social injustices in a community; investigating a social problem—ageism, sexual orientation, discrimination—and developing solutions" are few examples (Rutti et al., 2016, p. 429). Although community members need to devote their time and available resources for service-learning projects, their efforts are rewarding for the community as a whole. Service-learning projects can improve the overall well-being of the community (Salam et al., 2019).

From a theoretical perspective, a generalised framework for service-learning pedagogy has not been agreed upon yet among the scholars; however, most service-learning and community-related service-learning frameworks have roots in the experiential learning theory of Dewey (1938), further developed by Kolb (1984) in his experiential learning cycle, consisting of four phases: concrete experience; reflective observation, abstract conceptualisation, and active experimentation (apud Salam et al., 2019).

By getting involved as active participants in community learning projects, students acquire crucial and diverse skills, such as communication skills, problem-solving skills, analytical thinking, innovative solutions, and work in a collaborative environment (Salam et al., 2019). Community service-learning projects also challenge the values of students, increase their social awareness and responsibility, and strengthen their character and civic engagement (McLeod, 2013; Marshall et al., 2015).

Faculty members are at the centre of initiation through the design of service-learning courses and projects by ensuring smooth delivery of activities in the local communities and organisations (Salam et al., 2019). Along this process, professors play major roles as collaborators, facilitators, and supervisors who assist and monitor students in implementing their service or community learning projects (Voss et al., 2015).

The purpose of our research was *to find out the perceptions of students* about their *learning processes and outcomes* of SWMG, in the context of teaching the workshops *exclusively in the online medium*, due to the forced shift generated by the pandemic by comparison with the teaching of the same discipline in the *face-to-face environment via traditional classroom* instruction. The *main hypotheses* of the study are the following: (1) The teaching and learning mediums shape the type of skills achieved by students; and (2) General self-assessment of SWMG workshops in terms of their usefulness for field practise in social work is different according to the teaching and learning environment. For further study, our research also included several *questions*: (1) How important was the feedback provided by the coordinating teacher and by peer colleagues during SWMG workshops as a mode of learning? (2) What were the social problems, client populations, and types of groups chosen by the students to acquire the skills needed to lead a professional group in social work? (3) Which one of the social roles played by the students during the SWMG workshops brought them the greatest satisfaction and why? What social roles played by the students during SWMG workshops have they brought them the most discomfort, and why?

MATERIALS AND METHODS

Study Design and Participants

This study has a mixed research design. It provides a perspective over 2 academic years, between 2018 and 2020. It attempts to investigate two different learning environments during the workshops of the compulsory discipline SWMG: the face-to-face environment vs. the online environment. The research focuses on the activities and deliverables of all the students that graduated the SWMG discipline in/ during the two academic years and that had the same coordinating teacher: 50 students in 2020 (cohort A) and 92 students in 2019 (cohort B). From the varied kinds of deliverables of students, like the final self-assessment sheet, the group plan, the laboratory protocols, lecture reading sheets, and other different homework. From all of these, the present study analyses the first two deliverables, using descriptive, inferential statistics and thematic content analysis.

Ethical Issues

The data used in this study include the deliverables accomplished by the students during a semester for the workshops of the compulsory course SWMG. Since this study was designed after the evaluation of the students at this seminar, the researcher had to ask for the consent of the students to use the information from their deliverables after the data were gathered. The informed consent of the students was easily obtained because the researcher was also the coordinating teacher of the seminar. The students understood the usefulness of this study and showed their openness and confidence that the authors would respect the principles of confidentiality and anonymity regarding their data. The authors ensured the participants that if there were drawn out relevant excerpts from their final self-assessment sheets and the plans of the group, some photos from the group activities or some screen captures with certain online activities, their names or faces would be protected. The authors have provided information about the study at the end of a course where the two cohorts of students participated. A separate folder has been created on the platform Google Classroom, and the students uploaded the

written and signed informed consent with their agreement to participate in the study. The study was approved by the Ethical Committee of the university affiliated with the authors.

Procedure

In the second semester of the second year of study, students at the Social Work specialisation have to attend the compulsory discipline SWMG, summarising 14, 2-h long workshops. The main task of students at this workshop is to prepare and conduct a one-session group, working in pairs as co-leaders and involving their colleagues as group members with different assigned roles. The workshops led by students were initiated during the fourth week of the semester, after the coordinating teacher led three introductory workshops: an introductory seminar with sociometric games and icebreaking exercises, adequate for the initial stage of a group program; a second workshop that presented the focus groups as a research tool in to distinguish it from the intervention groups in social work; the third seminar providing a demonstrative group session conducted by the teacher on a theme related to the educational system in Romania, with diverse activities and techniques suitable for an educational type of group.

After these 3 introductory weeks, students began to implement their own group sessions. In 2019, when the learning medium was exclusively face-to-face, the two group co-leaders could arrange the classroom. They provided their colleagues the necessary class materials for their practical activities: white A4 papers, coloured pens, scissors, paper glue, post-it, and scrapbooking materials. In 2020, students had to adapt their practical group activities to the exclusively online workshops (see **Annex 1** for some examples).

The students organised in pairs were given 45 min to lead a single-session group with their colleagues. In each workshop, two demonstrative group sessions were conducted. In searching the theme for their practical group session, students were encouraged to get the greatest possible advantage from their previous and current internship stages in the institutions and NGOs in the social work field from the communities of origin, mostly in the rural areas, or from Cluj-Napoca. In this municipality, the "Babeş-Bolyai" University is located. The field practise allowed the students to meet different vulnerable categories of beneficiaries and see how the professionals resolve their problems and fulfil their needs. Until the second academic year, students already learned theories and methods applied in the social work field with individuals and families. At the SWMG workshops, students were asked to conduct a one-session group, bringing a socio-psychological problem of a community in a practical scenario. Guided by this recommendation, students freely chose the social problem they were interested in, the client population, and the group type. The only request was to prepare a planning list and avoid the same combination of the three items. The rest of the students played each time the specific roles proposed by the co-leaders, according to the client population the group co-leaders proposed. After each group session, oral feedback with the co-leaders was given by their colleagues who participated as group members and by the teacher, who played the role of the passive observer during the group sessions. Before each group session, the two co-leaders had to design a plan for the

forthcoming practical activity. The request was that the co-leaders should propose at least four activities and divide them equitably between themselves during their group session. Each group led by the students was audio or video recorded with the agreement of the audience, and the material was used only by the co-leaders to complete their group plan.

The task of planning and conducting a one-session group was designed from a service-learning perspective. During a semester, the students were allowed to use the knowledge from previous disciplines and the skills acquired in the internship stages to test a group approach to solve a community problem. They were also allowed to prepare themselves throughout a guided academic context to implement such group models in a real community environment during the third year of study when they chose their graduated thesis topic. The thesis of students in social work is done with the coordination of an academic adviser from the university and under the supervision of a professional from an institution or an NGO from the social work field. This pedagogical perspective corresponds to some frameworks described in the literature devoted to community-related service-learning programs (Ali et al., 2012; Salam et al., 2019). The implemented group session and the completed group plan counted two points from a total score of 4 points assigned to the evaluation criteria of the workshop.

During the academic year 2018–2019, the SWMG workshops unfolded in a classroom at the campus of the university, while in the second semester of the academic year 2019–2020, all the workshops, including the groups led by students, ran on the *Zoom* platform. In 2019, all the homework of students were delivered in print, as opposed to 2020, when all the deliverables that the students had to develop/ handle have been uploaded on the platform *Google Classroom* (see **Annex 2** for an exemplification of the structure of deliverables students from cohort A had to follow). The teacher created a folder for each deliverable that the students had to upload, including the task requests, some explanation regarding the deliverable, and the deadline.

At the end of the semester, all students had to complete the final self-assessment sheet, an evaluation tool with reciprocal benefits. It was designed to help the students reflect on the overall experience and gains made by their involvement as leaders and group members with different social roles and provide the coordinating teacher valuable feedback about the perceptions of students of the efficiency of the practical activities and assignments. The self-assessment sheet had to be sent to the teacher during the week after the semester. It counted 0.5 points from a total of four points from the SWMG workshop. This self-assessment sheet served as an instrument for the instructor to refine the pedagogical strategy of the workshop to maximise the benefits of the professional acquisitions for students.

Measurements

To respond to the objectives and questions of the study, we analysed two deliverables from the students: the single-session group plan and the final self-assessment sheet.

The group plan included the following compulsory sections: the psycho-social problem, the client population (role of group members), the type of group by purpose, the teaching techniques

implemented during the workshop (the debate, the role-play, the exercise, the narration, etc.), the materials and technical means used (paper, pencils, whiteboard, post-it notes, a projector, a computer, short videos from the internet, presentation of the information in PowerPoint), and a short description of each activity proposed by the co-leaders with the contribution and feedback of the group members and of the evaluation of the teacher. The co-leaders were given 1 week to finish this assignment by incorporating some relevant contributions of the activities of the colleagues of a group and a qualitative evaluation for each of the four group activities and then to provide the teacher the completed plan of the group session.

The self-assessment sheet included qualitative and quantitative measures related to the diversified activities of students accomplished during the SWMG workshops. Although not conceived as a standardised tool, the self-assessment sheet had more sections dedicated to: the protocols containing a reflective work on two self-selected workshops; the roles played in the group sessions as leaders and as different group members; a reflection on the feedback received and given from the perspectives of leaders and group members; gains from the overall participation at the workshops; the relevance of the literature they read; the evaluation of the general usefulness of the workshops; qualitative feedback regarding the usefulness of the final self-assessment sheet and the SWMG workshops as a whole.

From the structure of the self-assessment sheet, we decided to analyse four items from different sections. First, we were interested in the types and number of skills students declared they acquired during the SWMG laboratory. These indicators were captured through the following question: "In which areas do you think you benefited the most from participating in SWMG workshops?" In the sheet, the following examples were given from which students could choose one or more: self-awareness; communication; networking; reflection/ conceptualisation of experiences; self-control; improvement of other professional skills. For this study, we grouped these skills into three categories: (a) training of cognitive or conceptual skills and self-awareness; (b) training of interpersonal skills; and (c) improvement in other professional skills. Students could choose one skill, more skills, or no skills; and if the last category was selected, students were invited to elaborate.

At the end of the self-assessment sheet, students were asked to evaluate the overall usefulness of the workshop. A Likert scale was used for this item, with 6 points from 1, meaning totally useless, to 6, meaning very useful.

From the four items dedicated to the feedback, we selected the last one for the analysis, which was formulated as follows: "As a way of learning, I consider that feedbacks are: as important as the roles played; less important; not at all important; I do not know."

We gave special attention to evaluating the roles played by students as members of the group sessions led by their colleagues. In particular, an item with two questions was taken into account for this study. Students were asked to reflect and to write about the following personal experiences: "Choose 3 roles that brought you the greatest satisfaction and explain the source of satisfaction (I managed to get into the role, the role made me more sensitive,

the role raised my awareness, through the role I learned new things)?"; and "Choose 2–3 roles that made you uncomfortable and explain the source of dissatisfaction (I did not manage to get in the role, I was asked too much, I did not know what to do in the role, I was not interested, or other reasons)?"

Data Analysis

To fulfil the purpose of the study, to answer the research questions, and to test the formulated hypothesis, we applied the techniques of descriptive and inferential analysis.

The answers collected from two deliverables of the students (group session plans and final self-assessment sheets) were included in two correspondent SPSS databases (one for each deliverable). Frequency tables and frequency percentage distributions were generated in the descriptive analysis. Significance tests specific to inferential statistics, namely Independent-Samples T-Test and association, were used for testing the hypotheses after the variables' classes and values were recoded to meet the criteria of each test applied.

RESULTS

In this section, we present the results of our analysis from a comparative perspective by the learning medium of the two investigated cohorts: the online learning medium for the 2020 cohort (cohort A) and the traditional face-to-face classroom learning medium for the 2019 cohort (cohort B).

Based on the analysis of data from the self-assessment sheet, the answers of the students at the item related to the achieved skills generated a sub-set of classes for each category, taking into account that the students also indicated a combination of the acquired skills as shown in **Table 1**.

According to **Table 1**, participation at the SWMG workshops in the online medium favoured the *training of cognitive/conceptual skills and self-awareness* to a greater extent than in the face-to-face learning environment. The opposite is true when the *improvement of other professional skills* is concerned. The distribution of interpersonal skills training presents variations across the cohorts: communication skills prevail in cohort A, while the combination of interpersonal skills is more frequently reported in cohort B. The high percentage of students who perceived no learning of interpersonal skills during the online group sessions is a striking result. Networking recorded the same relative weight in the list of interpersonal skills in both cohorts.

We summed up the skills mentioned by the students by category to test the first hypothesis, assuming that the environment of learning shapes the type of skills acquired by the students. The first category of skills acquisition had three possible values: 0 for none; (1) for either reflection/conceptualisation of experiences or self-awareness; (2) for both reflections of experiences and self-awareness, respectively. The second category of skills acquisition had four possible values: 0 for none; (1) for either communication or networking; (2) for both communication and networking; (3) for the three skills mentioned together (communication and networking and self-control). The third category had: 0 for none and 1 for mentioning

Category of skills	Students' cohort/learning environment			
	2020 – online		2019 - face-to-face	
	N	%	N	%
Training of cognitive/conceptual skills and self-awareness				
None	7	14.0	26	28.3
Reflection/conceptualisation of experiences	10	20.0	12	13.0
Self-awareness	19	38.0	34	37.0
Both reflection of experiences and self-awareness	14	28.0	20	21.7
Total	50	100	92	100
Training of interpersonal skills				
None	11	22.0	11	12.0
Communication	13	26.0	20	21.7
Networking	6	12.0	11	12.0
Communication and networking	15	30.0	36	39.1
Communication and networking and self-control	5	10.0	14	15.2
Total	50	100	92	100
Improving of other professional skills				
None	27	54	38	41.3
Improvement of other professional skills	23	46	54	58.7
Total	50	100	92	100

Dependent variable	Cohort	Descriptives		T-test result
Training of cognitive/conceptual skills and self-awareness	2020	N	50	$t = 1.862$
		Mean	1.16	df = 140
		St. deviation	0.65	$p = 0.065$
	2019	N	92	
		Mean	0.93	
		St. deviation	0.71	
Training of interpersonal skills	2020	N	50	$t = 2.372$
		Mean	1.30	df = 140
		St. deviation	0.93	$p = 0.019$
	2019	N	92	
		Mean	1.67	
		St. deviation	0.88	
Improving of other professional skills	2020	N	50	$t = 1.034$
		Mean	0.50	df = 140
		St. deviation	0.58	$p = 0.303$
	2019	N	92	
		Mean	0.60	
		St. deviation	0.52	

Degree of SWMG workshops' usefulness	2020		2019		Result of association
	N	%	N	%	
Very useful	39	78.0	49	53.3	$\chi^2 = 8,591$
Useful	6	12.0	27	29.3	df = 2
Some useful, some useless	5	10.0	16	17.4	$p = 0.014$
Total	50	100	92	100	

one of the other professional skills (e.g., empathy, active listening, and assertiveness). We used the Independent-Samples *T*-Test successively. We had an independent grouping dichotomous variable, represented by the two cohorts of students, and a quantitative dependent variable, measuring the number of acquired skills for each of the three investigated categories.

As **Table 2** shows, there is a significant difference between the two cohorts of students regarding interpersonal skills learning. The results of the Independent-Samples *T*-Test illustrated in **Table 2** indicate that in cohort B, students reported that they learned the interpersonal skills to a significantly greater extent than in cohort A ($t = 2.372$, $p < 0.05$). There is no significant difference in learning cognitive/conceptual skills and self-awareness and improving other professional skills between the two cohorts of students.

The second hypothesis assumes that the general self-assessment of SWMG workshops regarding their usefulness for professional/field practise in social work is different according to the learning environment.

The result of the association, illustrated in **Table 3**, reflects a significant difference in terms of the general perception of the usefulness of SWMG workshops between the two cohorts of students ($\chi^2 = 8,591$, $p < 0.05$). The distribution of frequencies indicates that cohort A reported to a greater extent that the SWMG workshops were very useful compared to cohort B (78 vs. 53.3%).

We looked at the importance that the students attached to the feedback they received from their colleagues and their coordinating teacher as a way of learning for the co-leading role and the other roles related to different client populations they played during the semester.

As shown in **Table 4**, almost 90% of all students appreciated that the feedback they received from the coordinating teacher and their colleagues during the SWMG workshops was as important as their roles in the groups they attended.

Analysis of the group plans developed for the SWMG workshops conducted by students from both cohorts included three dimensions/items: social problem or issue; client population; and type of group by purpose.

Table 5 presents the social/psycho-social problem or issue selected by students that conducted SWMG workshops in the online learning environment in 2020 and presents comparisons with students that conducted them in the face-to-face environment in 2019. Summarising the preferences of students, we can notice that social problems prevail in both cohorts, with a higher rate among students from cohort B than

TABLE 4 | The importance of feedback as a way of learning.

Cohort	Importance of feedback students received from the coordinating teacher and from their colleagues					
	As important as the roles they have played in the groups that they have attended		Less important than the roles they have played in the groups that they have attended		Total	
	N	%	N	%	N	%
2020	45	91.8	4	8.2	49	100
2019	76	88.4	10	11.6	86	100
Total	121	89.6	14	10.4	135	100

TABLE 5 | The psycho-social problem/issue elected by students who conducted Social Work Methods with Groups workshops in the online learning environment—2020 and 2019 cohorts.

The category of psycho-social problem/issue	Sub-categories (N, 2019–2020)	N/% by sub-category	
		2019	2020
Social	discrimination—of Roma people (2-0), against women in accessing the labour market and at the workplace (1-0), at the workplace (1-0), of children with disabilities (0-1), racism (1-0), in general (1-0); addiction or excessive consumption—of alcohol (2-0), drugs (3-2), gambling (1-0), work (1-0); bullying—cyberbullying, labelling among pupils (4-0); violence—in school (1-1), domestic (2-2); marginalisation of refugees (1-0); poverty and social inequality (1-0); child abuse (1-0); effects of institutionalisation on children (1-0); volunteering—its importance for youth, training of volunteers to integrate in an NGO team and for intervention in a Roma community (3-0); the problems of Romanian medical system (1-0); loneliness—and social isolation, in time of pandemic (2-3); difficulties of coping with new social status—divorced, single motherhood (0-2); risk of relapse (0-2); sexual education in schools (1-0); abortion (1-0); school dropout (0-1); bonus and malus of new epidemics Covid-19 (0-1)	32/68	15/56
Psychological/psycho-social	low self-esteem and lack of self-confidence (1-6); low self-awareness (0-2); memory disorders in old age (1-1); psycho-emotional imbalance (0-3); low level of assertiveness (1-0), importance of—mutual knowledge in a new group of pupils (2-0), a positive self-image and of awareness of self-worth (1-0), of feedback from peer group (1-0), harmonious social relations (1-0), friends in youth's life (2-0), childhood in adulthood (1-0), recreational games for children (1-0); role of parents in children's education (1-0); communication problems caused by disability (1-0); well-being (1-0); socio-emotional needs of people with visual impairments (1-0)	15/32	12/44
Total (N/%)		47/100	27/100

In the second column, in the round brackets, you can see the number of group sessions by specific topics conducted in each year: the first number refers to the number of topics chosen by students from 2019 cohort, and the second reflects those topics elected by students from 2020 cohort. The last line of this table indicates the total number of group sessions conducted in 2019, respectively in 2020.

among those from cohort A (68 vs. 56%). Students who led their group work in the online environment preferred issues from the psychological spectrum compared with those who conducted session groups face-to-face (44 vs. 32%). A look at the sub-categories of this type for the 2020 cohort reflects the preoccupation of students with topics related to social isolation in time of the pandemic, affecting self-esteem, psycho-emotional balance, or the capacity to cope with certain social statuses.

In analysing the client population the co-leaders addressed in their SWMG group session, we organised the data according to these main life stages: childhood, adolescence, youth, adulthood, and old age. **Tables 6A,B** address the situation in cohorts A and B, respectively.

Regarding the client population chosen by students in cohort A for their group sessions, 10 from 27 groups (33.33%) addressed

the category of young people: students themselves (four groups), isolated at home (three groups), living in a residential centre from the child protection system (two groups) and former consumers of ethnobotanicals (one group).

In cohort B, students opted for themselves (10 groups) and volunteer students (three groups), meaning 13 groups, respectively, 27.66% from a total of 47 group sessions.

Consequently, there is a slight difference between the two cohorts (of 5.67%), indicating that students were more prone to play their own role in the group sessions during the pandemic. Looking at the adult category, a remarkable observation is that the students from cohort A preferred a typology of people with psycho-emotional problems (five groups).

In both cohorts, there was a propensity for students to choose age categories similar to their life stage: youth and adolescence.

TABLE 6A | The client population the co-leaders addressed in their social work methods with groups (SWMG) workshops in 2020 cohort A.

Client population/group members' roles in the SWMG workshops		N	
Category	Sub-category	By sub-category	By category
Children	Who witnessed domestic violence	1	2
	Who failed at school	1	
Adolescents	In general (aged 14–18 or 16–18)	3	3
Young people	Students (in general or before the exam session)	4	14
	Isolated at home	3	
	Single mothers	3	
	Living in a residential centre from the child protection system	2	
	Former consumers of ethnobotanicals	1	
	Refugees	1	
Adults	With low self-esteem	1	6
	With psycho-emotional imbalance	1	
	Recently separated/divorced	1	
	Women victims of domestic violence	1	
	Parents of children with disabilities	1	
	Persons who have committed an infraction while driving in the context of alcohol consumption, under supervision in the probation service	1	
Old people	Over 65 years, retired	1	2
	Lonely old people	1	
Total of group plans			27

TABLE 6B | The client population the co-leaders addressed in their social work methods with groups (SWMG) workshops in 2019—cohort B.

Client population/group members' roles in the SWMG workshops		N	
Category	Sub-category	By sub-category	By category
Children	Primary school students	4	7
	5th grade students	1	
	With special needs	1	
	In a day centre who excessively use the mobile	1	
Adolescents	High school students (9th to 12th grade)	14	17
	12th grade from a community where a group of refugee is about to be integrated	1	
	Single mothers under 18 years	1	
	In general (aged 17–19)	1	
Young people	Students themselves	10	18
	Students in the last year of study	2	
	Volunteer students	3	
	Students in the 1st year studying pedagogy	1	
	Whose parents migrated abroad for work	1	
	In the role of future parents	1	
Adults	Alcohol dependent	1	1
Old people	In general	1	2
	Over 70 years	1	
Mixed	Former patients and medical staff from Romanian hospitals	1	2
	Parent-child dyad	1	
Total of group plans			47

Interestingly, students directed their attention to children and the elderly to the lowest extent.

The analysis of group types by purpose is illustrated in **Table 7** for both cohorts of students. The relative distribution reflects different preferences among the students by cohort. In cohort B, the students mostly preferred the educational (46.8%), prevention (21.3%), and socialisation (14.9%) groups, and they had the least preference for therapy and support groups. In cohort A, the students tended to choose group types that were associated with psychological outcomes. Thus, support (44.4%), growth (22.2%), and therapy (11.1%) groups were their most preferred groups.

The last analysis relates to the perception of the roles played by the students as co-leader and as group members that produced satisfaction or discomfort. In the final self-assessment sheet, the students were asked to enumerate and briefly describe three roles

TABLE 7 | Type of group by purpose—2019 and 2020 cohorts.

Type of group	2019–Cohort B		2020–Cohort A	
	N	%	N	%
Support group	2	4.3	12	44.4
Educational group	22	46.8	4	14.8
Growth group	4	8.5	6	22.2
Therapy group	1	2.1	3	11.1
Socialisation group	7	14.9	0	0
Self-help group	1	2.1	0	0
Prevention group	10	21.3	2	7.4
Total	47	100	27	~100

that satisfied them and two to three roles which created personal discomfort. The results are presented in **Figure 1**.

FIGURE 1 | The distribution of roles played by students during the Social Work Methods with Groups workshops in the online learning environment.
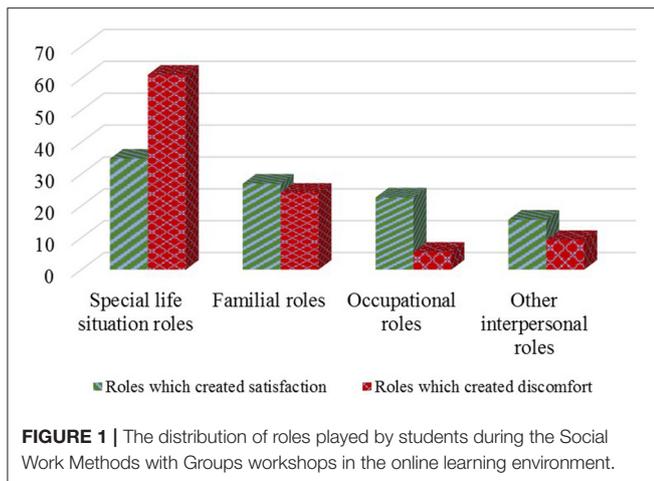
According to **Figure 1**, the level of satisfaction was higher in the case of occupational and other interpersonal roles, and discomfort was more prevalent when special life situation roles were interpreted. Familial roles produced quite similar levels of satisfaction and discomfort.

DISCUSSION AND CONCLUSIONS

The results of our study showed some relevant distinctions between the perceptions and experiences of the two analysed cohorts of students, which were shaped by different learning environments: entirely face-to-face in 2019 (cohort B) and exclusively online in 2020 (cohort A). Students who delivered their group sessions during the pandemic in 2020 perceived that they had trained *especially the cognitive/conceptual skills and self-awareness*, while students who conducted their group sessions in a traditional face-to-face classroom reported they exercised, in particular, *the interpersonal skills* (to aid in mutual understanding and affective skills) and *other professional skills, like contractual and problem-solving skills*.

According to the teaching/learning medium/environment, there is a significant difference in the general perceptions of the students from the two cohorts that were investigated regarding *the usefulness of SWMG workshops for professional practise* in the social work field. About three-quarters of students from the online learning environment reported that the SWMG workshops were useful or useful compared to slightly over half of students from the face-to-face learning environment. The fact that students perceived greater usefulness of the SWMG workshops in the online environment could be explained by at least two additional ingredients of the online workshops: *the therapeutic effect of the communication in the group setting* as an alternative to the isolation and the use of technology as a tool of learning, not as an amusing device that diverts the attention from teaching, as was the case in the face-to-face learning environment. Almost 90% of all students appreciated that the feedback they received from the coordinating teacher and their classmates during the SWMG workshops was a valuable way

of learning, and this was as important as the roles they played in the groups they had attended. *The online instruction slows down the learning process*, as the students must limit their questions to essentials/short descriptions and then give the teacher and the colleagues time to respond.

The results related to the choices of students for the psycho-social problem and the more specific themes for their group sessions reflect the diversity of institutions and NGOs from the social work field where the students completed their academic internships on the one side. The concerns of the students for a great variety of socio-psychological issues manifested in the Romanian society, among which domestic violence and violence against women, issues related to risky behaviours in young people (Faludi and Rada, 2019), and different problems of social functioning of diverse, vulnerable groups in interaction with their living environment (Neamțu, 2001; Gunzl and Neamțu, 2012). A greater appetite for these types of problems characterised the 2019 cohort when students were able to do internships in a variety of institutions and NGOs, while in 2020, students who were forced to stay at home preferred to focus on therapeutic and support groups, as a response to the constraints imposed by restrictions and affected by lack of academic contacts and geographical isolation. The strategy used in the planning and implementation of the groups used in the pedagogical strategy of the SWMG workshop in the two consecutive academic years could serve as a model for other schools of social work who want to develop the same social work skills described in this study.

Remote learning is not the most desirable educational option for a variety of reasons. If technical problems occur, equipment failures can interfere with virtual group participation, and online students may not communicate, submit their assignments, or access the study materials. Ideally, the social work field students gain the most from the hybrid teaching-learning vehicles: face-to-face *via* traditional classroom and online media, which can be combined in many creative ways. Both ways proved to be relatively effective. The next question is if one way is truly better than the other and from which perspective? Blended learning approaches show promising outcomes for teaching social work methods as the students can learn about cognitive/conceptual skills online and apply this knowledge in the classroom.

A blended or hybrid social work lab can take full advantage of the benefits of each platform—online and face-to-face – to promote student learning better than either platform alone (Jackson et al., 2020). One of the most important advantages of blended learning for students is to acquire a multitude of real-world skills that directly translate into life skills, preparing the students for their future by using social group work (Golea and Neamțu, 2012). "All students no matter their age learn differently and teaching methods should reflect this, by designing teaching programs in a way that reaches visual, auditory, and kinetic learners alike. With the heavy integration of technologies, we'll be able to improve teaching, information retention, engagement, responsibility, and enjoyment. Students never outgrow their learning styles, meaning blended learning is more important than ever, no matter what the industry is, from schools to corporations, from all walks of life" (TeachTaught., 2021). The research of Garrison and Kanuka (2004) concludes that blended

learning has the proven potential to enhance the effectiveness and efficiency of learning experiences.

The significance of our study is mainly in the area of comparative assessment of learning effectiveness from the perception and perspective of students, when studying the same discipline in the social work field, using the approach of service-learning as a variety of community-based learning in the context of two different teaching and learning environments and media: online and face-to-face instruction. Depending on what knowledge, skills, and competencies we wish to be acquired as outcomes of the social group work learning, we can choose a strategic combination of components focusing on modalities that students perceive as helpful and avoiding modalities that students perceive as not useful. Teaching SWMG role-playing can provide opportunities to understand various sides of a social problem and understand other viewpoints, and it can be effectively used in-person and virtual classes. It is important to provide guided self-reflection and supervision in a trusting learning environment for the effectiveness of the learning of students. Online relationship building and teaching the use of self in the virtual space can create major challenges regarding the effectiveness of social work education. To face the reality of uncertain times in an adaptative manner, the teaching-learning process in social work education needs innovation for the development of skills and competencies relevant for the society of the future. Our work opens new horizons for higher education delivery in applied social and behavioural sciences and reflections on future relations between teaching, research, and social service learning.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of Babeş-Bolyai University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.649691/full#supplementary-material

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Adjustment to COVID-19 Lockdown Among Italian University Students: The Role of Concerns, Change in Peer and Family Relationships and in Learning Skills, Emotional, and Academic Self-Efficacy on Depressive Symptoms

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In Italy strict containment measures against COVID-19 pandemic were implemented from March to May 2020 with home confinement and schools and universities closed. Students shifted to remote learning, experienced a forced isolation from peers and an increased sharing of time and spaces with the family. The influence of these aspects on the psychological adjustment of university students is largely unexplored. This paper was aimed at investigating the role of some correlates of depressive symptoms specific to the lockdown condition experienced by young university students, namely contagion concern, perceived worsening of family, and peer relationships and perceived worsening of learning skills. Moreover, the possible mediating effects of emotional and academic self-efficacy in these relationships were examined. Data were collected from 296 Italian university students (aged 18–25 years; 83% female students) through an online survey by means of a snowball sampling methodology in May 2020. Significant depressive symptoms were reported by 67% of participants. Contagion concerns were related to depressive symptoms through the mediating effect of emotional self-efficacy. Worsening of learning skills was related to depressive symptoms through the mediating effect of academic self-efficacy. Depressive symptoms were directly related to worsening of family relationships but unrelated to worsening of peer relationships. Results are discussed in relation to the need of preventive interventions for this specific population in view of academic activities planning in the post-COVID 19 period.

Keywords: COVID-19 lockdown, young adults, depressive symptoms, family relationships, peer relationships, emotional self-efficacy, academic self-efficacy

INTRODUCTION

In early 2020 Italy was the first western country to experience the COVID-19 pandemic outbreak. Since 9 March 2020, all schools and universities have been closed and remote learning has been activated, and at present university students still do not have face-to-face classes (except for a short period in September and October 2020). In particular, from 9 March to 3 May 2020, Italy lived a strict lockdown status, all activities were closed except essential services. For adolescents and young adults this confinement caused several changes in their daily lives. The closure of schools and universities and the interruption of leisure activities have affected habitual routines, forcing young people to share a lot of time with their families and, on the contrary, interrupting face-to-face relationships with peers. This is a condition never experienced before by most of the current Western population, whose psychological effects are now being studied all over the world. In recent months, the number of publications on the effects of this pandemic has risen sharply, but there are still few publications focused on young adults.

Referring to the life-span developmental perspective (Baltes, 1997; Elder and Shanahan, 2006) and focusing on young adulthood as theorized by Arnett (2000), our study aimed to investigate some aspects of the psychological adjustment of Italian university students to COVID-19 and containment measures through a cross-sectional research carried out in May 2020, during the last month of lockdown.

Lockdown conditions have represented a combination of changes that can make this population particularly vulnerable, as some studies indicate. Several studies found a significant increase in psychological problems (Brooks et al., 2020; Liang et al., 2020), in particular depressive symptoms (Meda et al., 2021), stress, irritability, anger (Shanahan et al., 2020; Taylor et al., 2020), anxiety related to the concerns of contagion (Mazza et al., 2020; Schiff et al., 2020; Xiang et al., 2020). Moreover, these psychological difficulties, in particular depressive symptoms, were found to be more common among young adult women than men (Ettman et al., 2020). Literature reported a female preponderance of depressive symptoms during young adulthood in normative situations (Beirão et al., 2020), thus this gender difference seems to hold true also during the non-normative situation of the pandemic. This paper was aimed at analyzing the role of some correlates of depressive symptoms specific to the lockdown condition experienced by young university students, namely contagion concern, perceived worsening of family and peer relationships and perceived worsening of learning skills. Moreover, the possible mediating effects of emotional and academic self-efficacy in these relationships were examined.

As stressed by Schiff et al. (2020) the COVID-19 related concerns represented a unique combination of worries related to both objective fears and subjective anxiety. University students' concerns about personal and parents' health represented one of the potential correlates of difficulties in functioning. In particular, the new perceived responsibility of taking care and protecting their relatives from being infected could have a significant impact on students' mental health.

Not only the contagion concern, but also the consequences of isolation can promote depressive symptoms. The imposed home confinement can have a significant effect especially for young adults (18–25 years old) who are experiencing a period of the life span characterized by specific developmental tasks, in particular a strong need of independence from parents, a redefinition of relationships with peers, and a need of making choices about future studies and job career (Santrock, 2019). The unprecedented situation of the lockdown represented a non-normative event and a developmental challenge in the life span (Hendry and Kloep, 2002), in which young adults were likely to experience difficulties in family, peer, and academic contexts (Fioretti et al., 2020).

Although the pivotal role of the family during youth has been extensively documented in the literature, the continuous cohabitation imposed by the lockdown may play a critical role. As stressed by Collins and Laursen (2004), during times of crisis parents can both intensify or mitigate the impact of stressful experiences on young people's mental health. In particular, during the imposed home confinement parents could offer support and contribute to create adaptive experiences or, on the contrary, their own concern about the pandemic and its effects could negatively affect youth adjustment (Ellis et al., 2020). Moreover, the interruption of physical relationships with peers may have significant consequences in terms of social status, sense of belonging to peer-group and lack of social and emotional support (Ellis et al., 2020; Elmer et al., 2020). Regarding academic activities during the lockdown, remote learning represented a new situation and many students experienced it as a major challenge, as they were largely unprepared (Blume et al., 2020). The online learning required new ways of studying and organizing one's own didactic practice to deal efficiently with academic tasks. Developmental psychology studies highlighted that problems in family relationships, social isolation from peers, and academic difficulties are all risk factors for depressive symptoms in youth (Kassis et al., 2017; Shore et al., 2018; Calandri et al., 2019; Schwartz-Mette et al., 2020).

As stated before, we were interested in examining the role of contagion concern, perceived worsening of family and peer relationships, and perceived worsening of learning skills on depressive symptoms with a view to a possible mediating effect of self-efficacy. Perceived self-efficacy consists in the personal belief to be able to face new situations, difficulties, and challenges (Bandura, 1997). In particular, emotional self-efficacy refers to the perceived abilities to regulate negative and positive emotions (Bandura et al., 2003), whereas academic self-efficacy refers to the perceived abilities to manage challenges and difficulties related with studying activities (Bassi et al., 2007). Self-efficacy is influenced by mastery experiences and emotions and self-efficacy in turn affects emotional experiences (Bandura, 1997; Usher and Pajares, 2008). In particular, both emotional and academic self-efficacy proved to have a pivotal role in managing stressors and protecting young people from depressive symptoms (Bandura et al., 2003; Calandri et al., 2021). We chose to examine the role of emotional and academic self-efficacy because during the lockdown, young students had to manage negative emotions related to the fear of contagion and to home confinement.

Moreover, they had to face remote learning, a completely new situation for which they had no previous experience of effective management (Besser et al., 2020). In particular, remote learning required new ways of regulating learning activities in order to face academic demands. These aspects are expected to influence students' self-efficacy beliefs and these in turn might be related to depressive symptoms.

Aims and Hypotheses

The present study examined the role of some correlates of depressive symptoms of young university students during the first COVID-19 Italian lockdown (March–May 2020), namely contagion concern, perceived worsening of family and peer relationships, and perceived worsening of learning skills. Moreover, emotional and academic self-efficacy were assumed as mediating variables in the relationships between these correlates and depressive symptoms.

The aims of this study were:

1. To describe COVID-19 contagion concern, perceived changes in family and peer relationships and in learning skills, levels of emotional, and academic self-efficacy and the presence of depressive symptoms in a group of university students, examining gender differences. This analysis was exploratory, and no specific assumptions were made, except for depressive symptoms which were expected to be higher among young adult women compared to men in the light of the literature reviewed above (Beirão et al., 2020; Ettman et al., 2020).
2. To investigate the role of COVID-19 contagion concern, worsening of family and peer relationships and worsening of learning skills on depressive symptoms and to explore the possible mediating role of emotional and academic self-efficacy.

   In particular, we hypothesized a mediating role of emotional self-efficacy between:

   a) COVID-19 contagion concern and depressive symptoms;
   b) Worsening of family relationships and depressive symptoms;
   c) Worsening of peer relationships and depressive symptoms;

   Moreover, we hypothesized a mediating role of both emotional and academic self-efficacy between:

   d) Worsening of learning skills and depressive symptoms.

The mediation models were tested including gender as a covariate to control its effect on depressive symptoms.

MATERIALS AND METHODS

Participants and Procedure

The present study was implemented by two Italian universities: University of Torino and University of Aosta Valley. Data were gathered through an online questionnaire (on the Limesurvey platform) by means of a convenience sampling technique (snowball sampling): each research team recruited participants sending the survey link to university students' mailing lists and to direct contacts in their geographical area. Respondents

in turn were invited to share the link with their contacts. Inclusion criteria were being a university student and living in Italy. Students provided online informed consent and confirmed their voluntary participation to the study. Respondents did not receive any incentive for their participation. Data were collected in May 2020, during the last month of lockdown. The study was approved by the Bioethics Committee of the University of Torino.

After deleting 44 incomplete responses, a total of 296 valid questionnaires were analyzed in this study. Students' age ranged from 18 to 25 years old (mean age = 20.9 years, sd = 1.3) and most participants were female students (83%). Most students lived with parents (92%), in line with Italian data (EUROSTAT, 2019). Most participants came from Northern Italy (94%), the geographical area most affected by the pandemic, although the whole national territory was in lockdown when data were gathered. Most participants were psychology students (45.6%) attending the first year of university (37.6%). The mean daily amount of time spent on remote learning was 5 h (sd = 2) (**Table 1**).

Measures

The questionnaire included validated measures to evaluate depressive symptoms, emotional, and academic self-efficacy, as

TABLE 1 | Characteristics of study participants (N = 296).

	N	%
Gender		
Male	50	17
Female	246	83
Age, *mean* (*sd*)		20.9 (1.3)
Course of study		
Psychology	135	45.6
Humanities/economics/law	77	26.0
Health and social sciences	41	13.9
Sciences/math/engineering	31	10.5
Missing	12	4.0
Academic year		
First	111	37.6
Second	96	32.4
Third	83	28.0
Fourth	5	1.7
Fifth	1	0.3
Remote learning (hours per day), *mean* (*sd*)		5.0 (2.0)
Devices for remote learning[a]		
Personal computer	259	87.5
Smartphone	66	22.3
Tablet	54	18
Living situation		
With both parents	211	72
With one parent	59	20.1
Other (alone/with peers/with partner)	23	7.8
Missing	3	0.1

[a] *The total is higher than 100% because more answers were possible.*

well as specific questions specifically developed for this study to investigate COVID-19 contagion concern and perceived changes of family and peer relationships and of learning skills.

COVID-19 Contagion Concern

COVID-19 contagion concern was investigated through three questions asking "How worried are you that you/your relatives/your friends are getting sick because of the COVID-19?", each one on a 4-point Likert scale (0 = not at all −3 = very much). A composite score of *COVID-19 contagion concern* was calculating by summing the three items (range 0–9) (Cronbach's alpha = 0.81).

Perception of Change of Family and Peer Relationships and of Learning Skills

Students were asked if their family relationships, peer relationships, and learning skills changed during lockdown. Each item was evaluated on a 10-points scale (from 0 = worsened a lot to 10 = improved a lot; midpoint of the scale 5 = no change). For descriptive analysis, each answer was codified in 3 categories, namely worsening (score 0–4), no change (score 5), and improvement (score 0–6). For the regression analysis, each answer was considered as a continuous variable, it was reversely coded and defined as "worsening of family relationships," "worsening of peer relationships," and "worsening of learning skills."

Depressive Symptoms

Students completed the Italian version of the CESD-10 (Pierfederici et al., 1982) which evaluates the frequency of depressive symptoms during the past week on a 4-point Likert scale (0 = rarely/never- 3 = most/all of the time). A cut-off score of 10 indicates the presence of significant depressive symptoms (range 0–30, Cronbach's alpha = 0.84).

Emotional Self-Efficacy

Emotional self-efficacy was evaluated through the Multidimensional Negative Regulatory Emotional Self-Efficacy Scale (Caprara et al., 2013) composed of 9 items which evaluate the perceived ability to regulate negative affect (anger, sadness, and fear) on a 5-point Likert scale (1 = not able at all- 5 = very able) (range 9–45, Cronbach's alpha = 0.85).

Academic Self-Efficacy

The scale of Bandura et al. (1996) evaluates the students' perceived ability of self-regulating learning activities, asking teachers and peers for help and motivating themselves to study. Some questions were slightly modified to be adapted to the

specific characteristics of remote learning (11 items on a 5-point Likert from 1 = not able at all to 5 = very able) (range 11–55, Cronbach's alpha = 0.88).

Data Analysis

The percentage of missing data was <5%. The MCAR (Missing Completely at Random) test (Little, 1988) was not statistically significant, indicating that missing data were completely at random. Therefore, the imputation was carried out with the EM (Expectation-Maximization) procedure. As for the first aim, descriptive analyses were carried out through frequencies, *t*-test for gender differences, Cohen's d as a measure of *t*-test effect size, and Pearson's bivariate correlations. As for the second aim, the four hypothesized mediation models were tested through the PROCESS SPSS-macro (Hayes, 2017). For each model, the statistical significance of the indirect effect was evaluated through a bootstrapping procedure (95% confidence intervals with 5,000 bootstrap samples). Confidence intervals that do not contain zero indicate a statistically significant indirect effect (mediation). The effect size was evaluated through the completely standardized indirect effect and interpreted as small (0.01), medium (0.09), and large (0.25) (Preacher and Hayes, 2008; Preacher and Kelley, 2011). Gender was included as covariate in all models to control for its effect on depressive symptoms. Statistical analyses were performed using SPSS 26.

RESULTS

Descriptives

Participants were mainly concerned that COVID-19 may infect their relatives (to some extent and very much 74%), less their friends and themselves (to some extent and very much 48 and 28.4%, respectively) (**Table 2**).

As for perceived change of family and peer relationships and learning skills, the worsening was mainly related to learning

TABLE 3 | Frequencies distribution of perceived change in family and peer relationships and learning skills.

	Improvement		No change		Worsening	
	N	**%**	**N**	**%**	**N**	**%**
Family relationships	157	53	94	31.8	45	15.2
Peer relationships	94	31.8	132	44.6	70	23.6
Learning skills	48	16.2	108	36.5	140	47.3

TABLE 2 | Frequencies distribution of COVID-19 contagion concern.

	Not at all		A little		To some extent		Very much	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Concerned that COVID-19 may infect yourself	74	25	138	46.6	69	23.3	15	5.1
Concerned that COVID-19 may infect your relatives	13	4.4	64	21.6	127	42.9	92	31.1
Concerned that COVID-19 may infect your friends	31	10.5	123	41.6	98	33.0	44	14.9

TABLE 4 | Descriptive statistics of study variables: means in the total sample and by gender.

	Total N = 296	Female N = 246	Male N = 50	t (df)	p	Cohen's d
	M (sd)	M (sd)	M (sd)			
COVID-19 contagion concern	4.6 (2.2)	4.9 (2.0)	3.1 (2.2)	5.9 (294)	0.0001	0.86
Worsening family	4.2 (1.9)	4.2 (1.8)	4.2 (2.0)	−0.1 (294)	0.956	0.00
Worsening peer	4.7 (1.7)	4.7 (1.7)	4.9 (1.7)	−0.7 (294)	0.466	0.12
Worsening learning	5.6 (1.7)	5.7 (1.7)	5.1 (1.9)	2.3 (294)	0.020	0.33
Depressive symptoms	13 (5.6)	13.6 (5.7)	9.9 (4.2)	4.4 (294)	0.0001	0.74
Emotional self-efficacy	24.3 (5.8)	23.3 (5.3)	29 (5.5)	−6.8 (294)	0.0001	1.05
Academic self-efficacy	36.1 (7.4)	35.7 (7.4)	38.3 (7.1)	−2.3 (294)	0.024	0.36

TABLE 5 | Bivariate correlations between study variables.

	1	2	3	4	5	6	7
1 Depressive symptoms	–						
2 COVID-19 contagion concern	0.18**	–					
3 Worsening family	0.24**	−0.04	–				
4 Worsening peer	0.11	−0.10	0.19**	–			
5 Worsening learning	0.32**	0.03	0.17**	0.12*	–		
6 Emotional self-efficacy	−0.55**	−0.32**	−0.10	−0.02	−0.15*	–	
7 Academic self-efficacy	−0.42**	−0.08	−0.13	−0.03	−0.60**	0.36**	–

*p < 0.05 and **p < 0.01.

TABLE 6 | Mediation effects in the tested models.

		Bootstrapping 95% CI	
		Lower	Upper
Predictor: COVID-19 contagion concern			
Direct effect	−0.01	−0.29	0.28
Indirect effect (emotional self-efficacy)	0.30	0.14	0.48
Completely standardized indirect effect (emotional self-efficacy)	0.11	0.06	0.18
Predictor: worsening family			
Direct effect	0.67	0.38	0.96
Indirect effect (emotional self-efficacy)	0.04	−0.10	0.20
Completely standardized indirect effect (emotional self-efficacy)	0.02	−0.03	0.06
Predictor: worsening learning			
Direct effect	0.44	0.06	0.82
Indirect effect (emotional self-efficacy)	0.13	−0.04	0.32
Indirect effect (academic self-efficacy)	0.39	0.15	0.65
Completely standardized indirect effect (emotional self-efficacy)	0.04	−0.01	0.10
Completely standardized indirect effect (academic self-efficacy)	0.12	0.05	0.20

skills, reported by almost half of the participants (47.3%), while in general peer relationships was perceived as stable (44.6%) and family relationships were perceived as improved (53%) or stable (31.8%) (**Table 3**).

Depressive symptoms mean score was 13 ($sd = 5.6$) and most participants ($N = 200$, 67.6%) reported a score beyond the critical cut-off (≥ 10). As for emotional and academic self-efficacy, mean scores were 24.3 ($sd = 5.8$) and 36.1 ($sd = 7.4$), respectively. Concerning gender differences, female students reported higher COVID-19 contagion concern, higher worsening of learning skills, higher depressive symptoms, and lower emotional and academic self-efficacy than male (**Table 4**).

Results of correlation analysis showed that depressive symptoms were positively correlated with COVID-19 contagion concern, worsening of family relationships and worsening of learning skills and negatively correlated with both emotional and academic self-efficacy. Moreover, emotional self-efficacy was negatively correlated with COVID-19 contagion concern and worsening of learning skills. Academic self-efficacy was negatively correlated with worsening of learning skills (**Table 5**).

Results of correlation analysis showed that worsening of peer relationships was not related either to depressive symptoms, or emotional self-efficacy, thus the relation between worsening of peer relationships and depressive symptoms mediated by emotional self-efficacy was not tested.

Mediation Analysis

The first model tested the relation between COVID-19 contagion concern and depressive symptoms mediated

by emotional self-efficacy. Higher COVID-19 contagion concern was related to lower emotional self-efficacy and lower emotional self-efficacy to higher depressive symptoms. The indirect effect of COVID-19 contagion concern on depressive symptoms was statistically significant ($b = 0.30$, 95% CI [0.14, 0.48]) thus confirming the hypothesized mediating role of emotional self-efficacy. The completely standardized indirect effect indicated a medium effect size (**Table 6** and **Figure 1**).

The second model tested the relation between worsening of family relationships and depressive symptoms mediated by emotional self-efficacy. Lower emotional self-efficacy was related to higher depressive symptoms, whereas worsening of family relationships was unrelated to emotional self-efficacy. The hypothesis of a mediation effect of emotional self-efficacy between worsening of family relationships and depressive symptoms was not confirmed, because the indirect effect was not statistically significant ($b = 0.04$, 95% CI [−0.10, 0.20]) (**Table 6** and **Figure 2**).
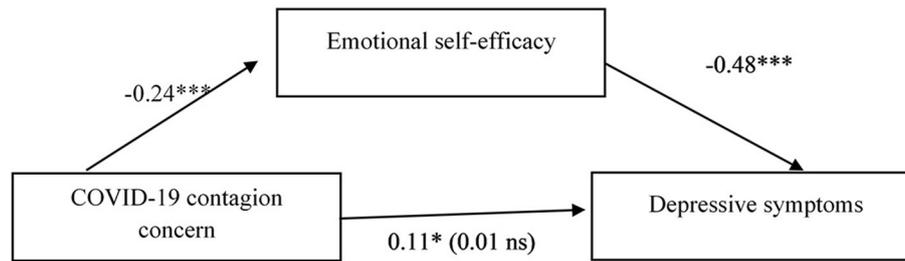
FIGURE 1 | Standardized regression coefficients (beta) for the relation between COVID-19 contagion concern and depressive symptoms as mediated by emotional self-efficacy. $*p < 0.05$; $**p < 0.01$; and $***p < 0.001$. In parenthesis the standardized regression coefficient between the independent variable and the dependent variable controlling for the mediator Gender beta $= -0.21***$. $R^2 = 0.26$; $F_{(3, 292)} = 34.57$, $p < 0.001$.
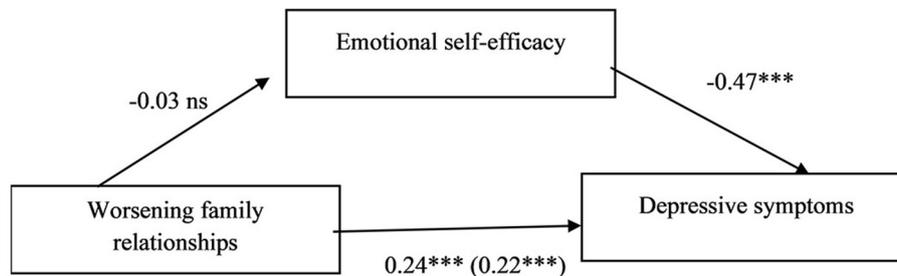

FIGURE 2 | Standardized regression coefficients (beta) for the relation between worsening in family relationships and depressive symptoms as mediated by emotional self-efficacy. $*p < 0.05$; $**p < 0.01$; and $***p < 0.001$. In parenthesis the standardized regression coefficient between the independent variable and the dependent variable controlling for the mediator Gender beta $= -0.25***$. $R^2 = 0.31$; $F_{(3, 292)} = 44.00$, $p < 0.001$.

Finally, the third model tested the relation between worsening of learning skills and depressive symptoms mediated by both emotional and academic self-efficacy. Worsening of learning skills was related to lower academic self-efficacy, whereas the relation with emotional self-efficacy was not statistically significant. Lower emotional and academic self-efficacy were both related to higher depressive symptoms. The indirect effect of worsening of learning skills on depressive symptoms was statistically significant through academic self-efficacy ($b = 0.39$, 95% CI [0.15, 0.65]), but not through emotional self-efficacy ($b = 0.13$, 95% CI [−0.04, 0.32]). Therefore, the hypothesized mediating role was confirmed only for academic self-efficacy. The completely standardized indirect effect indicated a medium effect size (**Table 6** and **Figure 3**).

DISCUSSION

The present study explored how COVID-19 lockdown affected academic activities and learning skills, as well as relationships with family and peers and mental health in a group of Italian university students. The study timely investigated some of the consequences of the lockdown during the first phase of the COVID-19 pandemic (from March to May 2020) focusing on an age group still neglected in literature.

As for the first aim of our study, the descriptive results indicated a high prevalence of depressive symptoms, in line with other studies on the consequences of the COVID-19 pandemic

and lockdown on young people's mental health (Liang et al., 2020; Meda et al., 2021). The high prevalence of depressive symptoms observed in our study (67% of the participants obtained a score beyond the CESD critical cut-off) deserves some considerations. It is worth noting that the reported prevalence of depressive symptoms largely varies in different studies on depression during COVID-19 pandemic, in relation to the psychological measures employed, as well as to demographic characteristics of participants. In particular, we found percentages varying from around 40% (Zhou et al., 2020) to 50% (Lan et al., 2020) up to around 60% (Solomou and Constantinidou, 2020).

Pre-pandemic studies generally reported a prevalence of depressive symptoms in the university population of around 30% (Liu et al., 2019; de Paula et al., 2020) and this percentage was also found among university students in Italy (Bert et al., 2020; Boietti et al., 2020). Therefore, the high rate of depressive symptoms found in our study seems to be in line with evidence that during the first phase of COVID-19 pandemic depression rate has increased significantly compared to the pre-pandemic period (Meda et al., 2021) and in some cases this prevalence rate has doubled or even tripled (Ettman et al., 2020).

Moreover, our result should not be considered so surprising, when considering some contextual factors of our study. First, data were gathered in May 2020, after a long and stringent period of lockdown (more than 2 months) that involved all the national territory and duration of isolation has been found to be correlated with mental health symptoms (Loades et al., 2020)

FIGURE 3 | Standardized regression coefficients (beta) for the relation between worsening in learning skills and depressive symptoms as mediated by emotional and academic self-efficacy. *$p < 0.05$; **$p < 0.01$; and ***$p < 0.001$. In parenthesis the standardized regression coefficient between the independent variable and the dependent variable controlling for the mediator Gender beta = -0.21***. $R^2 = 0.35$; $F_{(4, 291)} = 38.65$, $p < 0.001$.

also in previous pandemics (Brooks et al., 2020). Most of the respondents are resident in northern Italy, the part of the country hardest hit during the first phase of the pandemic, in terms of infection and mortality rates (Istituto Superiore di Sanità, 2020). Moreover, in Italy the lockdown was prolonged several times, with successive government decisions, resulting in great uncertainty. As outlined in the study of del Valle et al. (2020), greater uncertainty has proven to be related to higher anxiety and depression, especially among young women.

A final remark concerns the specific situation of Italian students. Universities in northern Italy had already been closed by the end of February 2020 and were not reopened before the end of the academic year. Students did not know for a long time whether they would attend the face-to-face classes again before the end of the year and what the situation would be for the new academic year. This great uncertainty was linked both to the particular moment and, more generally, to how studies would continue in the future. As mentioned before, uncertainty is supposed to have largely increased students' concerns and depressive symptoms.

The higher prevalence of depression among female students is an expected result, in line with studies reporting a higher risk for women to develop depression, both in normative and non-normative situations (Beirão et al., 2020; Ettman et al., 2020), thus gender differences seem to be maintained during the pandemic.

As for the other variables examined in our study, the descriptive analysis revealed that concerns related to COVID-19 contagion were widespread. This result was expected, especially due to the high spread of the virus in Italy during the period in which data were collected. The students were more concerned about contagion for their relatives than for themselves. This result can be linked to evidence that young age is a protective factor for COVID-19 complications, whereas the disease more seriously affects people over 60 (Istituto Superiore di Sanità, 2020).

Moreover, young adults experienced themselves as potentially dangerous to their loved ones and this is likely to have increased their concerns for relatives. Worries about one's own health and the health of relatives were identified as main pandemic stressors among college students also in other studies (Son et al., 2020; Yang et al., 2021).

The disruption of daily routines caused by lockdown seems to have had an effect especially on academic activities, more than on peer and family relationships. Almost half of the students perceived a worsening of their learning skills during lockdown, and this is a noteworthy result, highlighting the serious effects of remote learning on students' perception of their abilities. Many factors were likely to contribute to the perception of this deterioration in study activities: the lack of appropriate devices or Internet connection lines, the absence of face-to-face relationships with teachers and classmates, the reduced motivation in following lessons, as well as the difficulties linked to the new examination procedures (Biwer et al., 2021; Nguyen et al., 2021).

On the contrary, relationships with peers and family seem to have been generally preserved from the negative effects of lockdown. In fact, most students reported stable peer relationships and stable or even improved family relationships. On the one hand, young people are used to keeping in touch with their friends virtually and therefore this dimension of life is likely to have been experienced as a less radical change and has generated fewer problems (Hamilton et al., 2020), especially if compared to academic activities. On the other hand, our interpretative suggestion is that during lockdown young people were likely to give less importance to friendships and focused on those aspects that could be preserved in this period: study and family relationships.

A possible reason to explain our results about the overall good quality of family relationships during lockdown can be

found in the fact that the family has a pivotal role in the Italian context in terms of affective bonds, practical, and emotional support and most Italian young adults live with parents (Bonino and Cattelino, 2012). It is likely that for some participants the prolonged cohabitation with relatives was an opportunity to strengthen family ties and to experience reciprocal support and this was in turn related to better mental health as found in other studies (Ellis et al., 2020). In contrast, for a minority of participants, the forced cohabitation with their parents throughout the day and for such a long period of time may have caused conflict, stress and a perception of reduced autonomy (Fioretti et al., 2020), resulting in the experience of a deterioration of family relationships. Reduced autonomy collides with one of the main developmental tasks of young adults, namely the need for independence (Arnett, 2000). Italian university students, although often still living with their parents, realize their autonomy through extra-domestic activities: engagement in university, leisure activities, friendship, and couple relationships; all these aspects have been suddenly interrupted and prohibited by lockdown measures.

As for the second aim of our study, our hypotheses were partially confirmed. As hypothesized, COVID-19 contagion concerns were positively related to depressive symptoms, in line with the study of Montano and Acebes (2020), stressing the high vulnerability of young people to COVID-19 fear and to its implications on depression, anxiety, and stress symptoms. As expected, the association between COVID-19 contagion concern and depressive symptoms was mediated by emotional self-efficacy, suggesting that students who perceived themselves as more able to manage negative emotions were more likely to limit concern about COVID-19 contagion and to reduce its effect on depressive symptoms. During this ongoing pandemic, the burden of negative emotions is particularly heavy, therefore it is crucial to feel confident in one's abilities to manage them.

Regarding family relationships, as hypothesized students perceiving a worsening of family relationships reported higher depressive symptoms, but we did not find a mediating role of emotional self-efficacy. As previously said, only a minority of students experienced a worsening of family relationships. It is plausible that for these students the forced cohabitation in the family and the prohibition of experiences outside the home led to a worsening of family relationships and in turn to an increase in depressive feelings, irrespective of the presence of individual abilities, such as the confidence in managing negative emotions. However, our data do not allow to know the reasons of students' perception of a worsening of family relationships and further research investigating this aspect would be needed. Contrary to our expectations, a worsening of peer relationships was not associated with depressive symptoms. As previously stated, during lockdown friendships were likely to be maintained online and social media might have helped young people to cope with loneliness and psychological difficulties, as suggested in other studies (Cauberghe et al., 2021). Aspects concerning friendships and adaptation to lockdown among university students would also require further investigation.

Finally, as hypothesized, we found a higher risk of depressive symptoms for students reporting a worsening of learning skills. This finding suggests the extent to which the disruption of learning habits has been related to depressive feelings, as also outlined in other studies (Besser et al., 2020; Yang et al., 2020). As expected, the association between worsening of learning skills and depressive symptoms was mediated by academic self-efficacy: in other words, university students perceiving themselves as more able to manage their learning activities during home confinement were more likely to experience lower depressive symptoms. For these students, the ability of adapting to a new learning environment and new academic demands has been a resource for adaptively addressing the challenge of remote learning during lockdown.

The study has some limitations. First, participants were recruited using a convenience sampling approach and female, psychology students and first-year students were over-represented, thus limiting the generalizability of our results. Second, a selection bias may be linked to the use of online surveys. In particular, students who have less access to electronic devices and therefore experienced more difficulties during the lockdown are more likely to have been excluded from the study. Nonetheless, the use of snowball sampling through the Internet and the prevalence of female respondents are two features common to most studies published to date on the psychological effects of COVID-19 and related containment measures. Even though our participants were not representative of the population under study, the present research makes an important initial contribution to the knowledge that the scientific community is building about the psychological effects of this ongoing pandemic. Third, analysis with cross-sectional data could not establish causality and a more complex model of analysis could be used to analyze mediation in future studies. In fact, it is plausible that also depressive symptoms might have contributed to students' concern and perception of a worsening of their learning skills.

Despite these limitations, this study extends our understanding of the impact of the COVID-19 confinement on mental health of university students, an age group still under investigated, particularly in the Italian context. A further strength lies in the fact that our study has considered the role of family which is generally more studied with respect to childhood and less investigated in the case of young adults. This aspect is worth exploring in the Italian context, where family relationships are particularly significant not only for children and adolescents but also for young adults (Inguglia et al., 2015; Smorti et al., 2020). The high prevalence of depressive symptoms found in our study suggests that high attention should be paid to the psychological consequences of the pandemic for university students, especially to timely identify students more at risk for depressive symptoms. This knowledge is useful to develop and disseminate appropriate preventive interventions for a specific population largely neglected by Italian policies and media during the evolution of the pandemic. More broadly, the impact of the pandemic on university students in terms of mental health should be considered in the political choices for pandemic management.

The protective role of emotional and academic self-efficacy should be considered as an aspect to be enhanced to make students better equipped to face challenges. Our findings suggest that it is necessary for teachers to implement remote learning

while maintaining stimulating activities and promoting social contacts, even if virtual, to support students' motivation and promote their self-efficacy beliefs. These objectives are difficult to achieve in an emergency condition, but they must be considered in planning future academic activities in the post-COVID-19 period (Nguyen et al., 2021; Rabaglietti et al., 2021). In particular, in view of a gradual resumption of a new "normality," it will be important that remote learning and teaching processes will be planned according to the recommendations on online learning indicated in literature (Kearns, 2012). We believe that the results of our study should be considered in the post-COVID-19 recovery phase to promote the empowerment of university students who represent a population group particularly affected by the psychological effects of the pandemic and lockdown.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Comitato di Bioetica dell'Università degli Studi di Torino. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ECal conceived the study, provided statistical analysis and interpretation of the data, and wrote the manuscript. FG participated in the study design and coordination, provided statistical analysis and interpretation of the data, and wrote the manuscript. TB participated in the study design, contributed to data collection, and collaborated in writing introduction of the manuscript and editing of the manuscript. ECat participated in the study design, contributed to data collection, and contributed to the interpretation of the results. SG participated in the study design, contributed to data collection, and collaborated to statistical analysis and interpretation. CR participated in the study design and contributed to data collection. AF participated in the study design, contributed to data collection, and to statistical analysis and interpretation. All authors read and approved the final manuscript.

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Teaching and Learning Modalities in Higher Education During the Pandemic: Responses to Coronavirus Disease 2019 From Spain

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The effects of the pandemic have affected and continue to affect education methods every day. The education methods are not immune to the pandemic periods we are facing, so teachers must know how to adapt their methods in such a way that teaching, and its quality, is not negatively affected. This study provides an overview of different types of teaching methodology before, during, and after the coronavirus disease 2019 (COVID-19) pandemic. This study describes the different types of teaching (e.g., presence learning, blended learning, and distance education) used in two Spanish Universities (i.e., one private and one public) during the pandemic. A new teaching methodology is proposed. The purpose of this study report is to share what we learned about the response to COVID-19. Results provide a basis for reflection about the pros and cons of teaching and learning modalities in higher education. The current situation demands that we continue to rethink what is the best methodology for teaching so that the education of students is not affected in any way. This study is useful for learning about different teaching methods that exist and which ones may suit us best depending on the context, situation, and needs of our students.

Keywords: teaching and learning modalities, educational technology, COVID response, performance, satisfaction, ICT, teacher competencies, higher education

INTRODUCTION

As a result of the situation caused by the State of Alarm driven by the coronavirus disease 2019 (COVID-19), the educational system has been forced to adapt to the new capacity requirements and, in many cases, cease their usual activity.

The Community of Madrid, Spain, forced the closure of educational centers on March 12, 2020. A few days later, on March 14, 2020, the State of Alarm was decreed for the entire Spanish territory for an initial period of 15 days with strict measures of confinement and with restrictions on the movement of people and on the economic activity. This confinement was extended until June 21, 2020. Thus, the longest State of Alarm in the history of Spain ended after 3 months of confinement to stop the spread of COVID-19, and the so-called "New Normal" began. The restrictions on the movement between the Spanish provinces ended, and the coexistence with the virus began.

One of the most important decisions made at the educational level took place on April 14, 2020. The Government and the Autonomous Communities of Spain agreed that the academic year of 2019–2020 Educational System would end in June, and repetition would be exceptional at primary and secondary levels. Face-to-face classes, in general, would resume in September. During the 2019–2020 course, only those students who needed reinforcement or changed their educational stage, as well as children from 0 to 6 years old whose parents did not do telework, voluntarily returned to the classrooms. This was a very important shock not only for University levels but also for all educational levels.

From March to September 2020, due to the declaration of a State of Alarm by the National Government, the educational centers could not be opened, and they had to optimally adapt to this fact. Each educational center had to base its teaching on the online mode and to adapt teachers and students to this new reality: videoconferencing software was used to avoid social disconnection, students were disoriented, ignorance of new tools had to be overcome to teach classes, and the evaluation systems need to be redesigned. The pandemic revealed the shortcomings of educational institutions, mainly about the infrastructures and the training of teachers in the Information and Communication Technology (ICT) tools. However, it also meant improvements. The teachers were trained in new online methodologies and showed interest in learning new teaching tools in the face of the new reality and challenges that arose.

As of the new academic year 2020–2021, which began in September 2020, this teaching modality became eligible again. Each University, therefore, chose the type of methodology that it would use to carry out in its classes. In the universities themselves, depending on the faculties and the studies, different teaching methodologies are currently used.

EFFECTS OF COVID-19 ON THE EDUCATION PERFORMANCE OF UNIVERSITY STUDENTS IN CLASSROOMS

The Spanish University System (SUE) is made up of a total of 83 universities—50 public and 33 private (**Figure 1**).

- Out of the 50 public universities, 47 offer presence learning, and 1 offers distance learning.
- Out of the 33 private universities, 28 offer presence learning, and 5 offer distance learning.

In addition, there are two public universities with a special status that provide only specialized postgraduate programs (master's and PhD courses).

Factors considered in the following sections are the type of University, whether it is public or private, and the type of studies pursued, since there will be some in which an online model has already been implemented naturally, or vice versa, i.e., 100% face-to-face modality. As of September 2020, Spanish universities have used the teaching methods detailed in the following sections.

Presence Learning

Presence learning consists of both the students and the teacher sharing the same physical classroom. Previous studies have emphasized the educational benefits of the use of this teaching practice (Bigg, 2003; Konopka et al., 2015; Crisol Moya, 2016; Anderton et al., 2021; García-Peñalvo et al., 2021). This type of teaching methodology could not be applied from March to September 2020 due to the declaration of a State of Alarm by the government of the nation. However, as of September 2020, this teaching modality became eligible, and the educational centers were reopened.

The non-face-to-face teaching model is becoming increasingly popular in the field of higher education. Universities traditionally oriented to face-to-face teaching, regardless of whether they are public or private, are embracing this model. Although they maintain their main face-to-face structure, they offer students some distance-based degrees and master's studies (Ben-Chayim and Offir, 2019; Ali, 2020; Hodges et al., 2020).

A face-to-face University that decides to include non-face-to-face teachings in its degrees and master's studies must combine its traditional procedures with the new requirements of non-face-to-face teaching (Chick et al., 2020). The universities that have already had this experience, even though they have been mostly presential, have been able to adapt more quickly to the suspension of in-person activity.

Distance Education

Distance education, also known as online learning, is a type of education developed using technology that allows students to attend classes in remote locations (Dede, 1990; Hodges et al., 2020; Sandars et al., 2020). It can also be defined as a type of education that joins professors and students from different locations. Although they maintain their main face-to-face structure, they offer students some distance-based degrees and master's studies. On the one hand, several authors have recognized that online teaching can be synchronous when the students and the teacher connect to the classes at the same time and can have real-time interactions. On the other hand, in asynchronous teaching, the teacher and the students do not have to coincide in the class. Usually, the class is recorded, and the students can view it at any time (Adedoyin and Soykan, 2020; Ali, 2020; Bao, 2020).

This type of teaching, which was already followed before the pandemic, was not affected by the pandemic (Hwang, 2018; Daniel, 2020). Distance education is characterized by having an existing organizational infrastructure, which allows the educational objectives of online learning to be developed (Singh and Hardaker, 2014).

We must not confuse this type of teaching, i.e., distance education, with the *Emergency remote education*. In exceptional situations that impede the normal functioning of institutions and face-to-face educational centers, teachers may be forced to quickly adapt their pedagogical activity to a virtual environment. This is known here as emergency non-face-to-face teaching. In Spain, from March to June 2020, all teaching methods were entirely online. The emergency remote teaching required by the pandemic was often quickly improvised, without guaranteed or

FIGURE 1 | Geographical distribution of the Spanish universities with activity in the academic year 2019–2020. Statistics report (2020–2021) from the Ministry of Education and the Ministry of Universities. Universidades.gob.es. 2021. Available online at: https://www.universidades.gob.es/.

adequate infrastructure support (Evans et al., 2020; Hodges et al., 2020; Panisoara et al., 2020). Given this lack of infrastructure, the main source of advice and early support for non-expert distance teachers was focused on providing the technological tools available in each institution and was considered adequate to support the change.

Blended Learning

This model is based on a combination of classroom education and online education in various forms (Lightner and Lightner-Laws, 2016; Nuruzzaman, 2016; Heilporn et al., 2021). There is no unanimity of criteria, since the meaning is ambiguous, causing confusion, and gives rise to a certain lack of rigor between the different types of blended learning (Misseyanni et al., 2018; Bao, 2020). It is necessary to distinguish between hybrid teaching, mirror classrooms, blended teaching, and the new methodology proposed in this study, i.e., online guides in the classroom.

Hybrid Learning

Hybrid education assumes that half of the students in a class attend the classroom and the other half follow the class from home, partially online and partially face-to-face (Misseyanni et al., 2018; Bao, 2020).

The use of the *hybrid-flexible* (*HyFlex*) instructional methodologies is relatively recent in higher education (Beatty, 2019). As has been previously reported in descriptive case studies, the *HyFlex* techniques are implemented by an instructor.

Previous research has shown efforts to include this methodology, although few studies report the impact on student learning and the associated metrics of interest, such as qualifications, retention, pass rate, and time to graduation (Lightner and Lightner-Laws, 2016; Beatty, 2019, Binnewies and Wang, 2019; Mumford and Dikilitaş, 2020).

From September 2020, in Spanish universities that followed this methodology, groups of face-to-face students and online students alternated to achieve social distance without having to modify the structure of the classrooms.

Mirror Rooms

With the accumulated incidence of COVID-19, one of the options used in Spanish University education was the so-called "*Mirror Rooms*," which allows face-to-face classes but at a safe distance, ensuring a distance of at least 1.5 m between the chairs. To maintain the safety distance measures in the case of not having large enough classrooms, the group of students is divided into two subgroups. Half of the group is in a classroom, with the teacher, while the other half is in an adjoining classroom, watching the class by live videoconference. The advantage of this typology compared with hybrid education, in which half of the students follow the class from home, or compared with a blended education, in which the face-to-face education is alternated with online teaching, is that, in *Mirror Rooms*, the students do not depend on their resources or the connection in their homes, since the entire process is carried out in the educational center,

including the online part. They have their classmates in class for support and motivation and are able to continue enjoying contact with classmates and a University environment (Misseyanni et al., 2018).

The drawbacks of this type of methodology are the need to have enough classrooms, in addition to the technical resources necessary to broadcast the class live and personnel who can control these mirror classrooms. Another disadvantage supposes students do not have any engagement directly with the lecturer, who will be in standing in another classroom, being a similar situation to that in asynchronous online classes. In University studies, this methodology may be feasible, but not so much in other educational stages, in which it will not be easy for students to be alone in a class and pay attention.

A "Semi-Presential Learning" Blended System

The approach of the blended system is mostly carried out with the alternation between face-to-face classes and online education, either by videoconference or by independently following, i.e., individually or in groups, the tasks begun in class in person. A variety of this model is splitting up students and having those groups take turns going to class. According to the study by Cândido, in the semi-present context, students alternate online activities with face-to-face meetings (Cândido et al., 2020). This means fewer contact hours for each subject, which will be compensated with work from home. For example, if we work on projects, students can take part in the classroom and stay at home when they cannot go to the school in person.

Online Guide in the Classroom

Another new approach to blended learning education that is proposed in this study is what we have called the "*Online guide classroom*." This new methodology has been made evident by the new reality of the pandemic. A person who has been in contact with another person who has tested positive for COVID-19 should take the contagion test and stay at their home until the results of the test are known. In this situation, teachers, who physically have no symptoms and are well, have noticed how their teaching has been interrupted, being a detriment to their students.

In an *Online guide classroom*, the teacher stays at home, or another location, and teaches through a computer, and the students physically travel to the campus to follow the video conference. The advantage of this type of teaching is that, if the teacher is in the previous situation, is in quarantine and might have been exposed to COVID-19, or is even unable to attend a class, e.g., for other activities, e.g., assisting a Congress in another country, students will not miss class. In addition, students will be able to continue enjoying University life and to carry out group work in person with their classmates. This option is particularly necessary for science students who need to work in the laboratories for their lessons (Anderton et al., 2021). The classroom will need to meet certain technical requirements to be able to project the videoconference, e.g., microphones and cameras incorporated in the classroom, i.e., the same hybrid-learning technical resources that prior research suggests (Hwang,

2018; Bao, 2020; Salikhova et al., 2020), as well as staff or students responsible for connecting these devices.

METHODOLOGY

An investigation was carried out with the purpose of analyzing whether the change in the teaching–learning methodology, due to COVID-19, diminished in any way the quality of the education and/or the satisfaction of the students.

The sample consisted of 307 University students who voluntarily decided to participate in the investigation and who were subdivided into two groups. The first group, surveyed in November 2020, was made up of 152 University students, 128 women and 24 men between 19 and 22 years of age. The second group, surveyed in February 2021, was made up of 155 University students, 57 women and 98 men between 19 and 22 years of age, so the sample consisted of a total of 185 women and 122 men. The students pursued different University studies as follows: Early Childhood Education, Primary Education, and Physical Activity and Science Sports + Physiotherapy (a double degree program). We were especially interested in the point of view of the former two groups because they will become teachers. We added students not directly related to education to the sample for more heterogeneity. In addition, the first group of students, surveyed in 2020, was composed of students from a private University, and the second group, surveyed in 2021, was composed of students from a public University. The percentage of women in the first group of students surveyed was much higher, but this was compensated with the incorporation of the second group of students surveyed, reaching a final proportion of 60% women and 40% men.

To conduct the study, the surveys were sent to each student through Google Forms to avoid paper processing and to facilitate their completion, each of them having been previously informed of the study objectives.

Before administering the questionnaire to the students, compliance with all the required ethical standards was ensured as follows: written informed consent, the right to information, confidentiality, anonymity, gratuity, and the option to abandon the study (MacMillan and Schumacher, 2001).

This research was not approved by an ethics committee, since the data are not clinical or sensitive, although they were anonymized.

All questions used for our study referred to three possible classroom situations experienced by all students from 2020 to 2021. The study was carried out in the different modalities developed according to the governmental restrictions in Spain and around the world as follows:

- First: The pre-COVID-19 scenario, without any social restriction: a face-to-face environment. Location(s): University.
- Second: The COVID-19 scenario, with all social restrictions: a confinement situation, and the perimetral lockdowns of regions: an online environment. Location(s): Home.
- Third: The current scenario, the COVID-19 scenario with some restrictions, living with the virus: a combination

of online, semi-presential, and online guide classrooms. Location(s): Home and University.

Throughout the academic year 2020–2021, no student was able to attend their classes in the same way they did at the beginning of the previous year, since the pandemic was still in force; however, in our study, all students surveyed had experienced all scenarios because they were all University students who were currently in their second year of University studies. Therefore, the two groups surveyed were able to answer the study questions based on their experience of classes without restrictions in the previous year, before the pandemic broke out, and to compare that with the current restrictions.

Students, as well as the teacher, had to adapt to the situation that was being experienced around the world and to change their teaching–learning methodology in order to continue learning. The main objective since the beginning of all these changes was to preserve the natural progress of the classes and ensure that the changes in methodology did not affect the quality of the education and the satisfaction of the students.

To analyze whether this objective was being achieved, students were analyzed in regard to their satisfaction, the quality of the education, and the feelings of the students during these new conditions and education modalities.

Instrument

Two instruments were used to measure educational quality and student satisfaction in regard to the three educational modalities described earlier. Six main items were assessed, in addition to the academic quality and the satisfaction of the students, over the three phases listed earlier. In the case of the 6 items, students were given a questionnaire made up of 6 parameters to be assessed individually. Each participant responded using a 10-point Likert-type scale, 1 being "totally disagree" and 10 "totally agree."

Items studied were as follows:

1. Accessibility
2. Satisfaction
3. Participation
4. Results obtained
5. Innovative value of teaching practice
6. Information and Communication Technology (ICT) Knowledge.

In the case of academic satisfaction with the classes, the scale suggested by Lent et al., composed of seven items that assess the degree of the satisfaction of students with respect to academic activity, was used (Lent et al., 2005). Each of the students who participated in the study responded using a 5-point Likert-type scale, 1 for "totally disagree" and 5 for "totally agree."

Limitations

The approach utilized suffers from the limitation that the study only captured the sample of two Spanish universities, i.e., one private and one public. The degrees studied are related to the field of Education (75%) and Science (25%): a degree in Early Childhood Education, a degree in Primary Education, and a degree in Physical Activity and Sports + Physiotherapy.

Statistical Analysis

Using the SPSS (IBM SPSS Statistics) statistical software, the missing values were evaluated, considering the items of each instrument to estimate whether it responded to a random distribution (Tabachnick et al., 2011). The arithmetic mean, SD, asymmetry, and kurtosis were also calculated in each case. As a criterion to evaluate the asymmetry and kurtosis indices, values between −1.00 and 1.00 were considered excellent, and values within the range of −2.00 to 2.00 were considered adequate (George and Mallery, 2011).

RESULTS

Compliance with the statistical assumptions was verified, the exploratory factor analysis was applied to demonstrate the underlying structure of the scale, and its internal consistency was estimated using the Cronbach's alpha statistic. First, the amount and pattern of the missing data were examined using the Missing Value Analysis Routine in SPSS. Since no variables that present more than 5% of the missing values were observed, no studies were conducted to evaluate the randomness pattern of the missing values. No outliers were observed (Goodyear, 2020). Following the recommendations of Zabala, the t distribution was used to determine the statistical significance, and the favorable results were obtained without having any case that exceeded the threshold considered (Zabala and Arnau, 2015).

The descriptive statistical values of the arithmetic mean and SD were calculated, and the asymmetry and kurtosis indices were obtained to analyze the normality of the distributions. Asymmetry and kurtosis indicated the shape of the distribution of our variables. These measurements allowed us to determine the characteristics of their asymmetry and homogeneity without the need to represent them graphically. All the variables presented indices between −1.5 and 1.5. Results were considered optimal for carrying out the planned statistical analyses (George and Mallery, 2011).

Three studies were carried out with the sample collected: Study 1 corresponds to the first group surveyed in November 2020, Study 2 corresponds to the second group surveyed in February 2021, and Study 3 corresponds to the entire sample, i.e., the first and second groups.

Study 1

The average evaluation of the *presence learning* was 7.2, with satisfaction and participation being the highest-valued items in this modality. Knowledge in ICT was the least necessary for performance.

In the case of the *online modality*, we observed the highest scores in accessibility and knowledge in ICT but the worst score in participation. In this case, an average of 7.8 was reached.

The *blended learning modality* reached an average of 8.1, obtaining scores around 7.5 and 9.3. The innovative aspects of this modality were most highly evaluated (**Figure 2**).

If we use the asymmetry and kurtosis values, it can be affirmed that, in all items, there is a high degree of concentration around the arithmetic mean. All participants agreed on the positivity of all the modalities of the teaching–learning classes of the study.

FIGURE 2 | Comparison of items in Study 1. Source: Own elaboration.
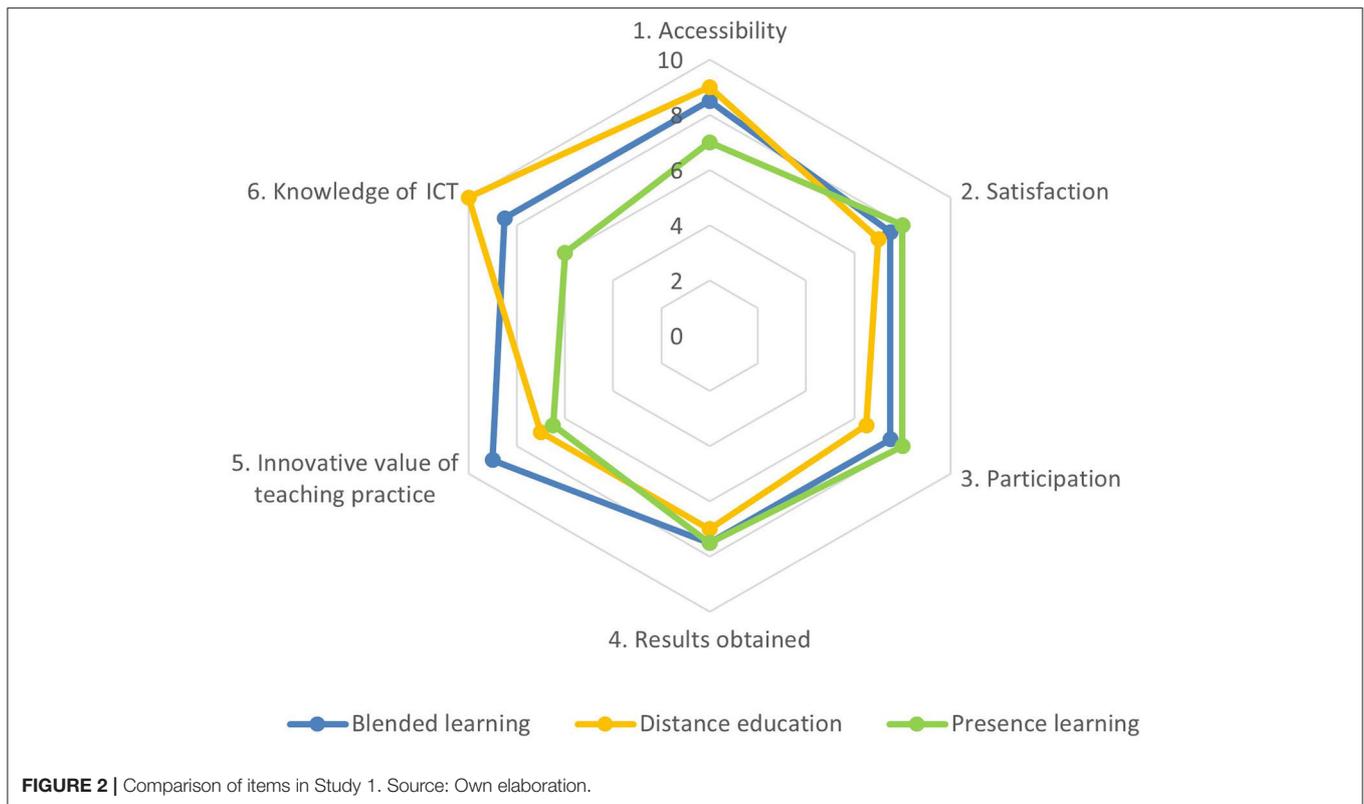
That is, all students considered the practice carried out to be excellent and highly beneficial for their education, and their satisfaction was not affected by the fact of having to change modalities during the course, although the students of this group, in general terms, preferred blended learning.

Regarding **Table 1** on the *blended learning* from Study 1, the degree of satisfaction in the students was very high, which indicates an excellent degree of significance (George and Mallery, 2011). In addition, all variables have a high SD and high asymmetry and kurtosis indices. The innovative value of teaching practice was scored with a 9.3, the highest score.

Table 2 represents the scores and indices of the statistical analysis of *distance education*. The best-scored item was Item 6, i.e., knowledge of ICTs reached 9.9 and had high asymmetry and kurtosis indices. The worst score was for the item that evaluated participation. Still, satisfaction reached a remarkable score.

Finally, **Table 3** represents the scores and indices of the statistical analysis of *face-to-face education*. Participation and satisfaction were the best-rated items here, i.e., the best in the entire Study 1, and the worst was for knowledge about ICT applications.

Study 2

In this study, the mean scores of the three teaching modalities improved in most cases. The average evaluation of the *presence learning* is 8.8, with the

TABLE 1 | Descriptive statistical analysis of the Academic Activity Scale in Study 1 with blended learning.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	8,50	0,67	−0,85	−0,07
2	7,50	0,30	−0,19	−0,77
3	7,50	0,96	−0,44	−0,25
4	7,50	0,70	0,97	0,44
5	9,30	0,42	0,55	−0,27
6	8,50	0,86	0,09	0,89

Source: Own elaboration.

TABLE 2 | Descriptive statistical analysis of the Academic Activity Scale in Study 1 with distance education.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	9,00	0,49	−0,11	−0,77
2	7,00	0,35	−0,27	1,20
3	6,50	0,14	0,98	−0,06
4	7,00	0,07	1,22	1,64
5	7,00	0,85	0,77	−0,02
6	9,90	0,07	−0,72	−0,15

Source: Own elaboration.

second- and third-most valued items being satisfaction and accessibility.

In the case of the *online modality*, we again observed that the highest score was for knowledge of ICTs. The average evaluation in this case was 7.9.

The *blended learning modality* reached an average of 7.0, i.e., 1.1 percentage points lower than in the previous study. The best score was obtained for knowledge in ICTs, and the worst was for accessibility (**Figure 3**).

As in the previous study, the statistical values of the arithmetic mean, SD, asymmetry, and kurtosis were recalculated. All items obtained excellent or adequate scores depending on the teaching modality, but all of them are ideal, between −1.5 and 1.5, for studying the three teaching modalities (George and Mallery, 2011).

Regarding **Table 4** on the *blended learning* from Study 2, the degree of ICT knowledge was high, but accessibility was scored with the worst value in this study for all learning modalities. Once again, it is remarkable that all the variables have ideal indices

in terms of the arithmetic mean, SD, asymmetry, and kurtosis (George and Mallery, 2011).

Table 5 represents *distance learning* and indicates once again that ICT knowledge has one of the best scores. The other scores

TABLE 4 | Descriptive statistical analysis of the Academic Activity Scale in Study 2 with blended learning.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	6,00	0,42	−0,04	−1,01
2	6,50	1,03	0,24	−1,20
3	6,70	0,52	0,72	0,20
4	7,20	0,99	−0,26	−0,41
5	7,50	1,30	0,34	−1,20
6	7,90	0,71	0,18	−0,34

Source: Own elaboration.

TABLE 3 | Descriptive statistical analysis of the Academic Activity Scale in Study 1 with presence learning.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	7,00	0,21	0,99	−0,68
2	8,00	0,78	0,52	−1,25
3	8,00	0,50	−0,35	−1,40
4	7,50	1,13	0,23	−1,49
5	6,50	0,85	0,75	0,11
6	6,00	0,57	0,34	0,16

Source: Own elaboration.

TABLE 5 | Descriptive statistical analysis of the Academic Activity Scale in Study 2 with distance education.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	8,50	0,51	−0,08	−0,90
2	7,20	0,57	0,20	−0,04
3	6,20	0,08	0,72	0,11
4	7,50	0,57	0,68	−0,14
5	8,40	0,26	−0,89	0,52
6	9,70	0,21	−1,13	0,98

Source: Own elaboration.

FIGURE 3 | Comparison of items in Study 2. Source: Own elaboration.
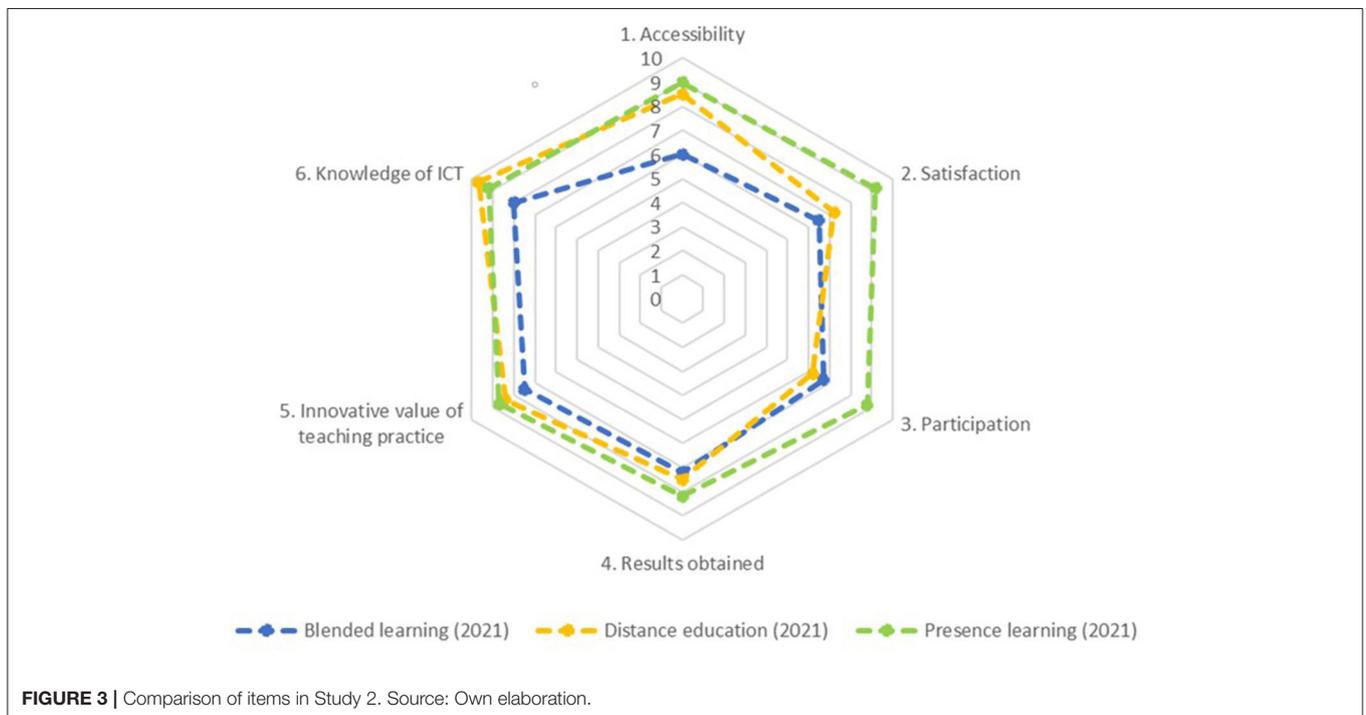
are excellent, except for participation, which is once again the worst score for this teaching modality (6.2). There is great unanimity in this value due to the rest of the statistical indicators.

Table 6 from Study 2 represents the *presence learning*, for which the scores of 9.2, 9.2, and 9.0 were obtained for satisfaction, ICT knowledge, and participation, respectively. The remaining scores for this modality were very high. The average score in this case, among all items, was 8.8, which means that it is the highest score achieved for any teaching modality among all of our studies.

Study 3

In Study 3, a comparison was made between Study 1 and Study 2, and a summary of both is provided. The following graph shows a comparison, one by one, of all items evaluated in the three teaching modalities in both studies (**Figure 4**).

The most notable evolutions are the 3.2-pp increase in ICT knowledge, the 2.2-pp increase in the innovative value of teaching practice, the 1.8-pp increase in participation, and the 1.2-pp increase in satisfaction with the *presence learning* in Study 2 compared with Study 1. These increases in scores will be explained in detail in the "Conclusion" section.

On the contrary, the greatest decrease in Study 2 compared with Study 1 occurred in accessibility in the *blended learning* modality, reaching a 2.5-pp decrease. Changes also occurred in the rest of the scores, but they were not as significant as the previous ones.

As shown in **Tables 7–9**, the complete sample is analyzed, i.e., Study Sample 1 and Study Sample 2, which composes the complete sample of Study 3.

Table 7 shows the total scores for the entire sample for the *blended learning*. Its average score is 7.5, reaching its best scores in Items 5 and 6, where the innovative value is 8.25, and the value of ICT knowledge is 8.2, respectively. The worst score, i.e., the satisfaction of the students, is 7.0.

In **Table 8**, the complete *distance learning* sample is analyzed. The best score, as in previous studies, is the knowledge of ICT, with a score of 9.8. However, the worst score is the participation of the students (6.4), and excellent statistical indicators were

TABLE 7 | Descriptive statistical analysis of the Academic Activity Scale in Study 3 with blended learning.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	7,20	1,84	−0,01	−1,68
2	7,00	1,76	0,56	−0,26
3	7,10	0,62	0,02	−0,84
4	7,30	0,35	0,90	1,35
5	8,25	1,63	−0,10	−0,86
6	8,20	1,06	−0,38	0,11

Source: Own elaboration.

TABLE 6 | Descriptive statistical analysis of the Academic Activity Scale in Study 2 with presence learning.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	9,00	0,51	−0,23	−0,67
2	9,20	0,99	−1,32	0,99
3	8,80	0,08	−0,83	−0,88
4	8,20	0,57	0,28	−0,54
5	8,70	0,59	0,78	−0,67
6	9,20	0,07	−0,25	−1,46

Source: Own elaboration.

TABLE 8 | Descriptive statistical analysis of the Academic Activity Scale in Study 3 with distance education.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	8,70	0,48	−0,24	−0,57
2	7,10	0,21	0,32	0,46
3	6,40	0,77	0,83	−0,01
4	7,25	0,42	0,86	0,29
5	7,70	0,30	−0,32	−1,22
6	9,80	0,07	−1,22	1,60

*Source: Own elaboration.*
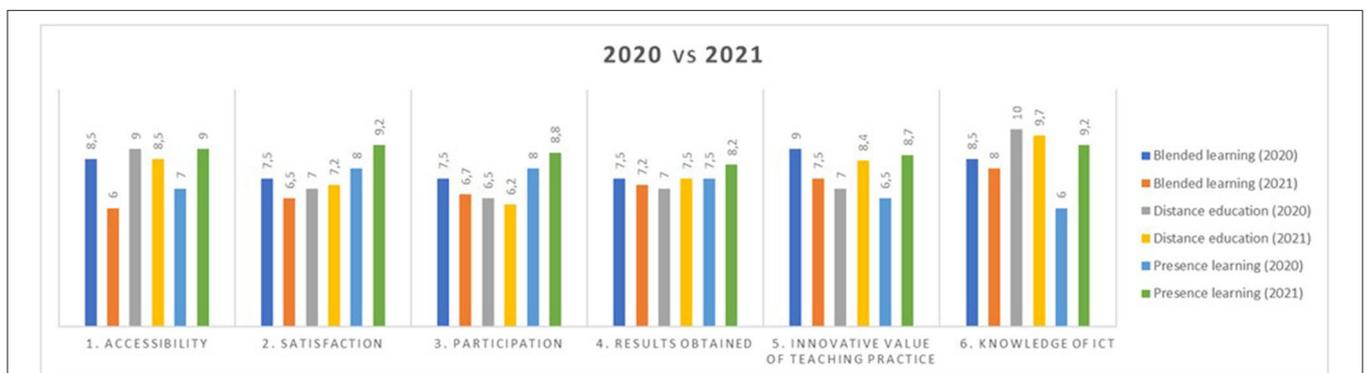
FIGURE 4 | Result of the items studied "Comparative of teachings in bar diagram" in Study 3. Source: Own elaboration.

obtained in all the statistical items. The average value for this modality is 7.8.

As shown in **Table 9** of our analysis on the *presence learning*, all statistical values are excellent and optimal (George and Mallery, 2011). The highest scores for satisfaction, participation, and accessibility stand out with 8.6, 8.4, and 8.0, respectively. In contrast, the values of innovation and ICT knowledge are each 7.6. Despite this, this modality obtains an average value of 8.0.

DISCUSSION

The Pandemic, Teaching Methodologies, and Teaching Infrastructures

The pandemic has modified the vital context in which study plans are implemented for two reasons: First, the use of new platforms has been necessary, considering that the circumstances that have arisen require different methodologies from those used when the curriculum was originally designed. Second, both the knowledge and the professional competencies required to implement these methodologies are in the spotlight, requiring the training of professionals and students. The two universities studied, despite being *face-to-face universities*, have had different tools to quickly adapt to *Emergency remote teaching*. In both universities, while there are some online studies, professors who taught in the programs studied here had to become trained quickly because they were not professors in other online programs that continued to be taught without difficulty.

Presence learning involves contact with students, the elimination of technical difficulties, equal resources for all students, and the elimination of potential family conciliation problems for both teachers and students. In contrast, it has disadvantages as follows: the time needed to travel to the location of the class and the impossibility of connecting with students who live far from the educational center or even abroad. According to different authors, the change to online teaching has not meant a great change for many universities in the world (Ali, 2020). However, the transition to the large-scale online learning is a very difficult and complex task for education systems. As a UNESCO report indicates, even under the best circumstances, it has become a necessity (UNESCO, 2021).

Online classes are increasingly being held at prestigious International Universities both in America and Europe in which any subject can be carried out without face-to-face contact

(Hwang, 2018). The idea behind this study, echoing the proposals of Bigg, is the recognition that any discourse on change and transformations of the school and its teachers is not limited only to the school environment. The participation of the educational community and, in this specific case of the University, the process of change can be the determining factors in the success of any innovation initiative that is attempted and, in the guarantee, through innovation and the use of ICT, of high levels of satisfaction in our students (Bigg, 2003; Tait, 2018; Bergdahl and Nouri, 2020; Reimers and Schleicher, 2020). The case of virtual teaching allows for more flexibility for learners who live in distant areas but also for teachers from different parts of the world. The platform used to broadcast classes live for the *Emergency remote education* (100% online or blended teaching) used in the private and public universities of this investigation was the same: Blackboard Collaborate. Blackboard Collaborate is a real-time video conferencing tool that allows one to add files, share applications, and use a virtual whiteboard to interact. One of the main advantages of Blackboard Collaborate is that one can run the application without having to install it on your computer. Blackboard opens directly in a browser without the need to install any software to join a session. The participation of the educational community and the involvement in the training of teachers in the two universities was evident. Both universities provided extensive help materials for the use of this tool, both written and in video format. In the case of the private University, a forum for interaction and the resolution of doubts was also set up. The private University provided an email to raise questions and gave live online courses for teachers.

The benefits of the *blended education* are for professors and students. With the potentiality of connection through the Internet, new learning possibilities arise, with added resources that help toward comfort, accessibility, effectiveness, and more options to access education. Classes in hybrid mode allow for optimization of the use of academic resources and grant control of the capacity and social distance, as there are fewer people in the classroom, such that the social distancing measures imposed by the state can be better complied with. In the case of *mirror classrooms*, they overcome many of the difficulties that the digital divide can cause (Beatty, 2019; Binnewies and Wang, 2019). Although the interest of this cited study focuses on undergraduate teaching, it is necessary to carry out the same study with other University stages. Other investigators have shown that the *blended learning training modality* in postgraduate programs is currently in high demand in Spain, and for this reason, the academic institutions promote their programs through the Internet, intending to attract students and promote the quality of their programs and institutions (López Catalán et al., 2018). According to Goodyear and other researchers, most studies highlight that hybrid learning modifies the role played by students. They take part not only as participants but also as protagonists in their learning, even becoming the co-configurators of learning environment/activities together with other apprentices (Beatty, 2019; Goodyear, 2020; Raes et al., 2020).

However, we acknowledged that there is considerable discussion among researchers regarding the disadvantages of

TABLE 9 | Descriptive statistical analysis of the Academic Activity Scale in Study 3 with presence learning.

Items	Arithmetic mean	SD	Asymmetry	Kurtosis
1	8,00	1,85	−0,29	−1,49
2	8,60	0,92	−0,52	−1,28
3	8,40	0,86	−0,11	−1,07
4	7,90	0,42	0,14	−0,72
5	7,60	0,30	1,45	1,34
6	7,60	0,71	0,65	−0,97

Source: Own elaboration.

Hybrid learning. The results of blended education in 2021 are worse in the public University (**Figure 4**, Items 1–3) due to the technical problems experienced by students during their development. If the technical means are not very good, i.e., if there are failures in the cameras, the microphone, or the program used by students to connect at home, students will lose their attention and interest. If certain technical requirements are not met, it will not be an effective pedagogical method (Hwang, 2018; Simpson, 2018; Traxler, 2018; Leoste et al., 2019; Goodyear, 2020; Hod and Katz, 2020).

In this study, we found differences between universities depending on the economic investment they had made in their facilities. In the case of the public University, the resources needed to broadcast the class from the University classroom for the blended methodology were scarce. There was no camera installed in the classroom, so the class had to be broadcast through the camera of a portable device, laptop, tablet, mobile, etc., in such a way that only one part of the class could be seen at one time, i.e., the face of the teacher or the blackboard. The private University installed high-quality cameras and microphones so that the classes could be broadcast live. The teacher just had to turn on the camera and connect to the Blackboard platform. The process was very simple. The students assessed that the quality of the media was adequate to fully follow the class from home.

There is no previous research using the *Online guide classroom* approach. To our knowledge, the *Online guide classroom* is an innovative methodology, appropriate for the times we live in, which potentially offers many advantages in the various situations studied in this research. It can be especially advantageous for confined situations, in science subjects where students need to use the laboratory, or under meteorological circumstances that make it impossible to travel to class. However, it also has shortcomings, as can occur with other blended methodologies, i.e., failures in technical infrastructure, image quality, audio, internet connection, etc., so universities need to make a stronger investment in technology. In addition, it will be necessary to have a person in charge of connecting devices and solving technical problems. This type of methodology, from our own experience, works very well in classes where students are autonomous and respectful, but it could be more complicated with less involved students.

CONCLUSION

One of the direct consequences of the pandemic has been the need, for both teachers and students, to modify teaching methodologies. During the periods in which the cumulative incidence of COVID-19 was at very high levels, it was necessary to engage in distance education or blended education, and teachers had to quickly readjust to these changes. This adaptation has meant a great enrichment of their knowledge in new didactic resources to teach their classes.

Thanks to training during the *distance education* and *blended education* classes, face-to-face teachers have learned new skills. As a result of the enrichment of their knowledge in new didactic resources, the innovation in teaching methodologies and the ICT knowledge of teachers improved due to the pandemic. In this study, Item 6, i.e., ICT Knowledge, improved 3.2 pp, and Item 5, i.e., Innovative value of teaching practice, was also better valued in 2021 because teachers learned new applications and methodologies for online and hybrid teaching that they later incorporated into face-to-face classes.

Other important aspects to consider are accessibility, participation, and satisfaction, i.e., Items 1, 2, and 3, which also improved substantially in Study 2. There was a 1.2-pp increase in satisfaction with the *presence learning* in Study 2 compared with Study 1. The students in Study 2, who had already experienced the restrictions and social distancing due to the pandemic, valued these items much more than the students in Study 1, which is very likely because they were able to enjoy face-to-face teaching again. Those aspects that one does not notice on a day-to-day basis may have begun to become more important once they were lost.

These results provide a basis to carefully consider this new era in higher education. We assumed that it is essential to change the paradigm of in-University education. Any subject—understood as an educational subject—should not be approached as a body of finished knowledge but as living knowledge that can be transmitted in person or not, depending on whether the context allows it. Similarly, it will be essential that teachers have enough ICT training to be able to use the most appropriate software and adapt to other pandemics that may befall society so that they can continue to provide quality education to students. It is not a problem of the satisfaction with different formats, be in-person, online, or a combination, as we have discussed previously, although most of the students state that they prefer a face-to-face format due to the interaction with their classmates, better participation in the classroom, and better understanding of the teacher. To be able to adequately follow daily teachings, there is indeed a need for the students themselves to have the necessary resources at their disposal, such as Internet connection and smart devices, so that they can connect to classes that today seem accessible to any University student of a developed country, but it will be important to provide the necessary resources for all students of any social context. Based on our experience, we supported the idea that, working together with educational centers, mixed teaching, or remote teaching are the best facilitators of learning, and neither COVID-19 nor any other pandemic can stop teaching if we have the knowledge, skills, and adequate resources.

The literature highlights deficiencies in the transition from face-to-face teaching to online teaching due to the weakness of the online teaching infrastructure, the inexperience of teachers, the digital divide, a complex home environment, etc. Although the advances in the use of educational technology support remote learning since the pandemic became a reality, the efforts to use this technology, and the large-scale advances in the distance and online education during the pandemic compel us to face an unprecedented technological revolution and take advantage of it. It is important to highlight the fact that, if the pandemic had not had this impact on education, the use of the technological evolution in educational environments might not have evolved so quickly in the last few months.

The results of the experiment show clear support for the *presence learning* from students in the public University, as they appeared to be more satisfied with it than with any of the other methodologies. The public University students preferred the *online teaching* as a second option since the quality of the class was also very high, and the *blended learning* was preferred the least. The satisfaction of the private University students was very similar with respect to these three teaching methods used in this University, with a slightly higher preference for face-to-face teaching.

This research provides new perspectives on a category of teaching education in the period of COVID-19. The results obtained corroborate conclusions reached by other studies (Hwang, 2018; Leoste et al., 2019; Goodyear, 2020; Wang et al., 2020), in which learning can be carried out in an efficient, high-quality, and satisfactory manner either through methods we choose or through methods to which the context forces us to adapt. We must choose a modality without affecting education.

Future investigations can validate the conclusions drawn from this study. In this study, we described preferences of teaching and learning modalities and showed that, although students value the possibilities of technology very positively, face-to-face communication with the teacher, to a larger degree, is believed to be required for success in their studies.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

Ethical approval was not required for this study in line with local legislation and institutional requirements. Before administering the questionnaire to the students, compliance with all the required ethical standards was ensured as follows: written informed consent, the right to information, confidentiality, anonymity, gratuity, and the option to abandon the study.

AUTHOR CONTRIBUTIONS

AV and JMV conceptualized and wrote the manuscript. Both authors contributed to the article and approved the submitted version.

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Forced Remote Learning During the COVID-19 Pandemic in Germany: A Mixed-Methods Study on Students' Positive and Negative Expectations

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The COVID-19 pandemic poses great challenges to higher education. Universities had to change their infrastructure to full remote teaching and learning environments in a very short time. Lecturers and students were forced to adjust their established routines and concepts of teaching and learning. During the first nationwide lockdown in Germany, we explored students' anticipations regarding the risks and chances of this challenging situation. They were asked about the negative and positive effects of this sudden switch to online university courses and the relevance personally ascribed to each of these expected effects. A sample of 584 students provided 3,839 statements, which were examined by means of qualitative content analysis. While 57.7% of the statements concerned negative effects, 42.3% dealt with positive ones. The range of expected negative and positive effects was wide, but key themes emerged particularly frequently. While the mentioned effects were generally considered to be of high personal relevance, negative effects were rated as significantly more relevant, but with only a small effect size. The relevance of negative effects was considered higher by master students than by bachelor students. Relevance ratings were significantly higher for the first effect mentioned compared with all subsequent effects, indicating an ease-of-retrieval effect, which is relevant from both a methodological and content perspective. The results provide important insights into students' perspectives on remote learning that will be significant beyond the current pandemic, as they can guide sustainable measures by exploiting opportunities and mitigating risks. We discuss practical implications and methodological limitations of the study.

Keywords: COVID-19, higher education, student perception, ease-of-retrieval effect, mixed-methods study, remote learning

INTRODUCTION

Since early 2020, the COVID-19 pandemic has had a considerable influence on society (Nicola et al., 2020). The first nationwide lockdown in Germany in March 2020 forced universities to change their infrastructure to fully remote teaching and learning environments in a short period of time. Lecturers and students were forced to adjust their established routines and concepts of teaching and learning (Shapiro et al., 2020). The lack of appropriate infrastructure, skills, and experience with remote teaching and learning had already been noted previously (Persike and Friedrich, 2016).

While media use in Germany increased rapidly from 2012 to 2015, the use of digital learning media stagnated (Dolch and Zawacki-Richter, 2018). Especially in higher education, students' media use does not necessarily correlate with digital learning, given that digital media are rarely an integral part of teaching and learning (Persike and Friedrich, 2016). Despite the fact that university administrations ascribe high relevance to digitalization processes, they were quite reserved when it came to assessing the status quo of digitalization in 2018 (Gilch et al., 2019). Indeed, the transition that universities usually "must undergo to adapt to online program delivery involves many complex issues" (Amirault, 2012, p. 253). Digital and remote learning measures are complex projects consisting of numerous conceptual and procedural steps that require substantial planning and preparation time (Rüth and Kaspar, 2017). Past research identified key factors that determine remote learning readiness in higher education, such as technological infrastructure, policy makers, financial aspects, human resources, but most importantly the skills and attitudes of teachers and learners (Rohayani, 2015). A survey at a large German university showed that the majority of student teachers does not perceive any learning opportunities for the acquisition of corresponding competences (Jäger-Biela et al., 2020).

Against the background of this unpreparedness regarding remote teaching and learning and due to the unpredictable duration and course of the pandemic, students may develop pessimistic expectations regarding their forthcoming study activities. Indeed, research shows that the pandemic has led to anxiety, distress, and uncertainty among German adults in general (Benke et al., 2020; Petzold et al., 2020). International studies revealed that the pandemic has had several negative impacts on students' well-being and psychosocial variables (Cao et al., 2020; Wang and Zhao, 2020), and that it has led to job losses or reduced income (Aucejo et al., 2020) as well as to new obligations and challenges in family life (Ayuso et al., 2020). However, remote teaching and learning can also have positive effects for students, for example, increased flexibility regarding the time and place of learning (Arkorful and Abaidoo, 2015). Also, students could expect positive impacts on the quality of learning materials and some long-term benefits to the universities' digital infrastructure (Getto and Kerres, 2017). It can be assumed that the transition to remote teaching and learning offers both opportunities and challenges (Adedoyin and Soykan, 2020). Students' expectations regarding remote learning have already been examined (e.g., Mupinga et al., 2006), but previous research focused on specific online courses and referred to existing infrastructure. In contrast, the present study focused on unprepared and forced remote learning during the COVID-19 pandemic, a situation in which students' specific expectations were mostly unknown. Hence, during the first nationwide lockdown in Germany in 2020 we asked:

RQ1: What negative and positive effects on their own study activities do students expect, given the abrupt transition to remote teaching and learning?

Irrespective of the quality of effects, the relevance personally ascribed to the expected effects may vary. People tend to give more weight to negative over positive information (Kanouse, 1984). Especially young people show pronounced negativity biases at the attention and memory level (Kaspar et al., 2015). Moreover, people tend to overestimate recent (negative) experiences (Kuchler and Zafar, 2019). Indeed, the pandemic situation is especially characterized by negative effects on individuals. Petzold et al. (2020) found that half of over 6,000 German respondents suffered from anxiety or psychological distress in connection with the COVID-19 pandemic. According to another study, anxiety and depression in young German adults were directly related to the reduction of social contacts and perceived changes in everyday life (Benke et al., 2020). Consequently, we assumed that negative effects would be mentioned more often and perceived as more personally relevant than positive effects:

H1: The number of expected negative effects is higher than the number of expected positive effects.
H2: Negative effects are perceived as more personally relevant than positive effects.

From a methodological perspective, when examining students' expectations, the order in which effects are mentioned is noteworthy: The fact that a certain negative/positive effect comes to mind first may suggest that it is more relevant than other effects subsequently mentioned. Indeed, the ease-of-retrieval hypothesis assumes that people use the ease with which information comes to mind as a heuristic applied to subsequent judgments (Schwarz et al., 1991; Menon and Raghubir, 2003). Similarly, Wänke and Hansen (2015) hold that the relative experience of fluency in cognitive processing is an important diagnostic cue for judgment formation. Therefore, we hypothesized that the perceived relevance of negative/positive effects decreases across effects mentioned by the students:

H3: There is a decrease in the perceived personal relevance of expected effects across responses.

MATERIALS AND METHODS

Participants

This study is the first part of a larger survey conducted in April and May 2020. The median duration to complete this survey part was 393.50 s. Incentives to participate were not provided. Conditions of participation were a minimum age of 18 years and enrollment at a German university. Students enrolled at distance-learning universities were excluded. The final sample contained 584 students from different universities (M_{age} = 24.07 years, SD_{age} = 4.88; 496 women, 82 men, 6 diverse); 403 students were in a bachelor's degree program and 181 were in a master's degree program. The sample was heterogeneous regarding the study program, but most of the participants (404) were enrolled in a teacher training program covering a range of scientific

disciplines, 71 were studying psychology, and 38 were enrolled in a media-related program.

Measures

The students provided informed consent and sociodemographic variables (age, gender, study program, university). Subsequently, they were asked to state up to five negative and positive effects they expect from the transition to remote teaching and learning (maximum 150 characters per statement). The instructions were as follows: "The coronavirus pandemic necessitates an (almost) complete conversion of university courses to a remote mode. Please indicate up to five negative/positive effects that you currently expect for your own studies due to this changeover." Given that the sudden outbreak of the pandemic, with all the resulting constraints and repercussions on everyday life and study activities, primed a rather negative mindset, we first asked all participants to name the expected negative effects. Afterwards, we explicitly asked them to reflect on potential positive effects. The students additionally rated the effects mentioned in terms of relevance, using a scale ranging from 1 (hardly relevant) to 5 (highly relevant).

Coding and Analysis

We performed a qualitative content analysis based on the standard approach by Mayring (2015), following previous works (Kaspar et al., 2010, 2014): Firstly, the transcribed responses were paraphrased. Next, a category system was inductively and iteratively developed by deriving the categories from the first 10% of the material covering 3,839 short statements in total. This resulted in two systems, one for negative and one for positive effects. Subsequently, the inter-coder reliability was evaluated to ensure the applicability and objectivity of the category systems. For this purpose, two persons independently coded the same material after prior introduction to both category systems. Inter-coder reliability was initially calculated after coding 10% of the material to detect possible sources of errors and to optimize the category systems accordingly. Once the category system had been optimized, the entire material was coded and the inter-coder reliability was quantified by Kappa (Cohen, 1960), indicating very good agreement with a minimum $\kappa = 0.88$ across all categories and mentioned effects. In rare cases of disagreement, a consensual agreement was subsequently achieved through discussion in order to allow frequency analyses.

RESULTS

Expected Effects (RQ1)

Table 1 (negative effects) and **Table 2** (positive effects) present the kind of effects expected by the students and associated quantities.

Among the negative effects associated with the transition to remote teaching and learning, the most frequently mentioned effects concerned social interaction and communication: The students provided 300 statements indicating a general decrease or lack of social interaction and communication. A fear of less contact, interaction with, and support from other students was expressed in 208 further statements, whereas 117 additional statements predicted less contact and interaction with lecturers and university staff as well as reduced feedback and support. It is to be noted that many statements addressed psychosocial variables, namely problems with self-regulation in terms of self-studying, self-organization, self-discipline, and problems with structuring everyday life (168), perceived uncertainty due to a lack of information (141), increased effort required for studying in terms of time and workload (129), decreased motivation in study activities and learning (69), and a lack of clear separation between study activities and private life, including childcare (21). A further substantial category are negative expectations regarding the quality of remote teaching and learning, including performance assessment (304), followed by negative effects on the course of studies, including study time extension (192), and the closure of university facilities and services and hence impeded access to university resources (180). Moreover, the students mentioned general problems and concerns regarding technology (48), technological problems on the student side, including hardware and software (57), but only rare problems regarding the stability of digital services (9). Several statements addressed the lack of an appropriate working environment (62) and negative effects on health (26). A general negative affect was stated 10 times. Finally, some statements (19) referred to financial problems.

Regarding positive effects of remote teaching and learning, almost one third of all statements referred to increased flexibility, including flexibility in time and work management (306), in the (asynchronous) reception and processing of course materials (107), in learning location (53), and an increased flexibility in general (61). The largest single category was the saving of time (325), but many statements also expressed a gain in media- and study-related competences and skills (217), hope for progress in digitalization in universities and society (142), hope for a better work-life balance due to remote learning (103), and slowing down as well as getting more sleep (18). Only some statements reflected an expected increase in the quality of digital teaching and learning (63), financial gains and savings during the challenging pandemic situation (20), increased motivation in study activities and learning (5), and protection of the environment (7). A few statements indicated benefits for communication and interaction (22). Importantly, only 18 statements addressed the underlying reason for the transition to remote teaching and learning, namely staying healthy.

Number of Negative and Positive Effects (H1)

Overall, 2,215 negative effects were mentioned, which corresponds to 57.7% of all statements, in contrast to 1,624 positive effects (42.3%). The students reported between zero and five negative and positive effects, respectively. On average, each student stated 3.79 ($SD = 1.40$) negative effects and 2.78 ($SD = 1.56$) positive effects. A t-test for paired samples showed that this difference was significant, $t_{(583)} = 14.08$, $p < 0.001$, $d = 0.58$. Hence, the ratio of negative to positive effects was unequal in favor of the negative effects. There were no significant differences between bachelor and master students regarding the number of

TABLE 1 | Category descriptions, number of statements in descending order, and example statements for negative effects.

Category of negative effects	n	Example statements
Decreased quality of teaching and learning, including performance assessment	304 (246)	"impairment of comparing performances in courses," "monotone tasks instead of interesting discussions on a topic," "practice-based courses like project seminars could lose quality"
General decrease or lack of social interaction and communication	300 (242)	"communication will be difficult," "negative effects on networking," "social life in the university ceases"
Fear of less contact, interaction with, and support from other students	208 (200)	"limited exchange with fellow students," "I cannot meet my fellow students and the start of the semester is socially impeded," "difficult small group work and cooperation with fellow students"
Negative effects on course of studies, including study time extension	192 (150)	"study is taking longer as not all lectures will be offered online," "cancellation of practical courses," "postponement of exams"
Closure of university facilities and services and hence impeded access to university resources	180 (153)	"problems accessing literature due to the libraries being closed," "no public spaces for self-studying," "exercise rooms are closed," "no possibility to borrow media equipment"
Problems in self-regulation in terms of self-studying, self-organization, self-discipline, and problems with structuring everyday life	168 (140)	"more individual responsibilities," "missing structure due to the lack of presence teaching," "more organization is required," "more independent work (self-study with texts)"
Perceived uncertainty due to a lack of information	141 (126)	"uncertainty how it will go on," "no detailed information on the part of the university and institutes," "poor communication of the university"
Increased effort required for studying in terms of time and workload	129 (114)	"higher performance requirement to replace presence," "increased time-based effort," "significantly more effort due to unfamiliar situation"
Less contact and interaction with lecturers and university staff and reduced feedback and support	117 (110)	"no possibilities for personal contact with the lecturer," "no personal supervision of the bachelor thesis," "fewer opportunities for questions to the lecturer," "reduced addressability of lecturers"
Decreased motivation in study activities and learning	69 (67)	"lacking motivation for digital learning," "decrease in motivation," "it is harder to get up"
Lack of an appropriate working environment	62 (59)	"no home office is possible due to noise," "inadequate working environment at home," "no suitable room for video conferencing"
Technological problems on the student side, including hardware and software	57 (53)	"unstable internet connection at home," "no well working laptop," "technology and internet is not sufficiently available to everyone"
General problems and concerns regarding technology	48 (47)	"technical problems," "technical challenges," "technical services and malfunctions"
Negative impacts of working environment on health	26 (25)	"headache and eye pain, because of being on the computer the whole day," "I miss activity, due to the omission of the ways to university," "too little physical activity in everyday life"
Lack of clear separation between study activities and private life	21 (21)	"increased mixing of private life and work, less relaxation," "worse separation between study and leisure time," "parallel childcare"
Financial problems	19 (17)	"financial losses," "I lost 1700€ due to a canceled field trip," "financial problems due to elimination of the part-time job"
General negative affect	10 (9)	"more stress of missing out," "feeling nervous," "adapting to unfamiliar situation is characterized by fear"
Technological problems regarding the stability of digital services	9 (9)	"congested online systems, for instance Zoom," "accessing problems to learning platforms," "LMS is overloaded"
Other unspecific or rare statements not fitting any of the categories above	155 (134)	"less concentration on the essential," "no face-to-face lectures"

Column n shows the number of statements and in brackets the number of students who provided at least one statement of the respective category (i.e., corrected for multiple responses of individual students falling into the same category).

reported negative effects, $t_{(582)} = -1.19$, $p = 0.236$, $d = -0.11$, and positive effects, $t_{(582)} = 1.23$, $p = 0.220$, $d = 0.11$. More details on the categories most frequently mentioned by the two student groups are depicted in **Table 3**.

Personal Relevance of Expected Effects (H2, H3)

We analyzed the relevance that students personally ascribed to the effects mentioned. Based on 527 students who provided at least one negative and one positive effect accompanied by relevance ratings, we compared the average relevance of negative effects ($M = 3.97$, $SD = 0.69$) and positive effects ($M = 3.77$, $SD = 0.91$), $t_{(526)} = 3.95$, $p < 0.001$, $d = 0.17$. Supporting H2, negative effects were perceived as more personally relevant, but with a

small effect size. Relevance of negative effects was considered higher by master than by bachelor students, $t_{(402.89)} = 2.78$, $p = 0.006$, $d = 0.24$. No significant difference between student groups was found regarding positive effects, $t_{(537)} = -0.32$, $p = 0.751$, $d = -0.03$.

To test H3, postulating a decrease in the perceived personal relevance across the effects mentioned, ANOVAs for repeated measures (Greenhouse-Geisser) were separately computed for positive and negative effects. A prior MANOVA, including relevance ratings of five negative and five positive effects, indicated a significant result ($p < 0.001$), but it was based on a greatly reduced sample size as only a few students reported ten effects in total. When inserting five levels to the ANOVAs (for five effects rated), we found a significant result for negative

TABLE 2 | Category descriptions, number of statements in descending order, and example statements for positive effects.

Category of positive effects	n	Example statements
Saving of time	325 (290)	"long way to university is spared," "more free time due to the omission of commuting," "saves time because everything can be done from home"
Increased flexibility in time and work management	306 (268)	"flexible division of time," "greater time-related flexibility participating in lectures," "free division of the workload"
Gain in media- and study-related competences and skills	217 (169)	"knowledge acquisition about digital media, also for the time after the pandemic," "getting to know methods and applications for digital teaching, for me as a trainee teacher"
Hope for progress of digitalization in universities and society	142 (124)	"university finally gets up to the newest technological standard," "advance in digitalization," "further development of technology and associated possibilities," "it is timely to digitize education"
Increased flexibility in the (asynchronous) reception and processing of course materials	107 (99)	"lectures and seminars are still available afterwards," "you can stop videos of lectures and listen to important parts multiple times," "multiple viewing of lectures"
Hope for better work-life balance due to remote learning	103 (95)	"easier combination of study, work, and household," "facilitates support of persons in need of care in the household," "easier childcare"
Increased quality of digital teaching and learning	63 (58)	"useful and good materials could be created, which can be worked from home," "digital contents are well prepared," "more intensive examination of the learning material"
Increased flexibility in general	61 (59)	"more flexibility," "own schedule," "more flexibility in the course of study"
Increased flexibility in learning location	53 (52)	"participation possible when sick," "not linked to a specific place," "flexible place of study"
Benefits for communication and interaction	22 (22)	"written and therefore reliable communication," "communication with lecturers until today," "cohesion despite distance," "more cooperation with lecturers and other students,"
Financial gains and savings during the challenging pandemic situation	20 (19)	"saving of money," "no costs for driving," "can go to work more often," "save money by spending less on entertainment or other recreational activities"
Staying healthy	18 (18)	"no risk of infection," "social distancing," "prevention of corona being spread," "no internal conflicts regarding infection risks"
Slowing down and more sleep	18 (18)	"deceleration," "less stress," "no obligation to get up early," "sleep longer"
Protection of the environment	7 (7)	"protection of environment due to omission of traveling," "less use of paper," "better for the environment"
Increased motivation in study activities and learning	5 (5)	"more motivation participating in lectures, due to no commuting," "learning motivation due to videos"
Other unspecific or rare statements not fitting any of the categories above	157 (128)	"strong connection to studies," "you wear more comfortable clothes"

Column n shows the number of statements and in brackets the number of students who provided at least one statement of the respective category (i.e., corrected for multiple responses of individual students falling into the same category).

effects, $F_{(3.90,\ 1,033.42)} = 15.42$, $p < 0.001$, $\eta_p^2 = 0.06$. As expected, the first effect mentioned was considered to be more relevant than any of the other four subsequent effects, all $ps < 0.001$ (Bonferroni-adjusted). No further significant differences were found. Similarly, relevance ratings of positive effects also decreased, $F_{(3.71,\ 451.96)} = 6.81$, $p < 0.001$, $\eta_p^2 = 0.05$; in this case the relevance of the first effect was higher than the relevance of the third, fourth, and fifth effect each, all $ps \leq 0.005$. When only the first three effects were included, the number of students in the ANOVAs substantially increased (**Table 4**) and replicated the aforementioned results, except that the relevance of the second positive effect was also significantly lower compared to the first effect. These relative results were complemented by t-tests comparing the observed mean values against the scale's midpoint. Mean personal relevance was above the scale's midpoint for all positive and negative effects mentioned. Effect sizes were medium to large, but higher for negative effects (**Table 4**).

Given that the first effect mentioned by the students was rated as personally most relevant, which effects were stated first? Regarding negative effects, students most frequently mentioned a general decrease or lack of social interaction and communication (90), followed by negative effects on the course of study (77), and a decrease in the quality of teaching and learning (60). Regarding positive effects, students most often referred to time-saving aspects (172), followed by more flexibility in time and work management (132), and a gain in media- and study-related competences (64). A complete overview is presented in the **Supplementary Material**.

DISCUSSION

Central Findings and Implications

In spring 2020, the COVID-19 pandemic forced teachers and learners to abandon familiar teaching and learning routines, and universities were suddenly required to create remote study

TABLE 3 | Comparison of bachelor and master students' five most mentioned categories for negative and positive effects.

	Most mentioned negative effects		Most mentioned positive effects	
	Bachelor	Master	Bachelor	Master
1.	General decrease or lack of social interaction and communication (13.7)	Decreased quality of teaching and learning, including performance assessment (15.5)	Saving of time (20.9)	Saving of time (17.8)
2.	Decreased quality of teaching and learning, including performance assessment (12.9)	General decrease or lack of social interaction and communication (13.2)	Increased flexibility in time and work management (19.3)	Increased flexibility in time and work management (17.8)
3.	Fear of less contact, interaction with, and support from other students (9.4)	Closure of university facilities and services and hence impeded access to university resources (11.3)	Gain in media- and study-related competences and skills (12.4)	Gain in media- and study-related competences and skills (15.6)
4.	Negative effects on course of studies, including study time extension (9.3)	Fear of less contact, interaction with, and support from other students (9.4)	Hope for progress of digitalization in universities and society (8.1)	Hope for progress of digitalization in universities and society (10.2)
5.	Problems with self-regulation in terms of self-studying, self-organization, self-discipline, and problems with structuring everyday life (8.8)	Negative effects on course of studies, including study time extension (7.2)	Increased flexibility in the (asynchronous) reception and processing of course materials (7.2)	Hope for better work-life balance due to remote learning (7.2)

Numbers in brackets indicate how many percent of the total number of negative/positive statements fall into the respective categories.

TABLE 4 | Students' ratings of the relevance personally ascribed to negative and positive effects expected from the abrupt transition to remote teaching and learning.

Order of effects	Relevance of negative effects						Relevance of positive effects					
	Descriptive statistics			One-sample *t*-test			Descriptive statistics			One-sample *t*-test		
	M	*SD*	*n*	*t*	*P*	*d*	*M*	*SD*	*n*	*t*	*p*	*d*
1.	4.27	0.94	560	32.21	<0.001	1.36	3.98	1.09	538	20.81	<0.001	0.90
2.	3.97	1.06	545	21.28	<0.001	0.91	3.89	1.06	451	17.95	<0.001	0.85
3.	3.97	1.00	478	21.25	<0.001	0.97	3.79	1.16	314	12.08	<0.001	0.68
4.	3.85	1.06	357	15.22	<0.001	0.81	3.73	1.21	185	8.22	<0.001	0.60
5.	3.84	1.16	270	11.91	<0.001	0.73	3.60	1.25	124	5.27	<0.001	0.47

Personal relevance of the stated effects was measured on a scale ranging from 1 (hardly relevant) to 5 (highly relevant). One-sample t-tests were computed against the scale's midpoint of 3. Sample size n decreases across the order of effects, as students were asked to name up to five effects per valence.

environments. The perspective of students on this new role of remote learning has also been examined quantitatively by Adnan and Anwar (2020), however, with a limited scope on specific topics. A qualitative approach was taken by Irawan et al. (2020) via unstructured phone interviews, but this study covered only a small sample. The present study examined students' expectations by means of a mixed-methods but structured approach and based on a large sample. We gathered 3,839 statements from German students reflecting negative and positive effects related to forced remote learning and the relevance personally ascribed to these effects. Our key findings are as follows:

Firstly, students expected a wide range of effects, but the negative effects outnumbered the positive ones. This result may reflect the overall negative impact of the pandemic, which was already perceived at the time of the study in spring 2020 (Petzold et al., 2020). There was heightened anxiety among students at this time (Wang and Zhao, 2020). This result is also in line

with known forms of negativity bias in the domains of attention and memory (Kaspar et al., 2015) and information weighting (Kanouse, 1984; Kuchler and Zafar, 2019).

It is striking that many expected negative effects expressed a decrease or lack of social interaction and communication with others, including fellow students and lecturers. Correspondingly, Adnan and Anwar (2020) found that students ascribe high relevance to face-to-face contact even in remote learning settings. Past research indicates that communication, interactivity, and social aspects are considered as quality criteria of digital learning (Masoumi and Lindström, 2012). Indeed, counseling and support by lecturers in remote learning settings were found to be predictors of course satisfaction and learning achievement (Paechter et al., 2010). Hence, social isolation is a critical problem and must be adequately addressed in remote learning. Another substantial number of statements reflected anticipated problems with self-regulation in terms of self-studying, self-organization,

self-discipline, and problems with structuring everyday life. Indeed, self-regulation is crucial for performance in remote leaning settings in general (Sharma et al., 2007) and it can be supported by characteristics of the learning environment such as usefulness and interactivity (Liaw and Huang, 2013). However, in times of a pandemic, many areas of everyday life are severely restricted and usual routines do not take hold, so that increased demands are placed on the ability to self-regulate. Also, many statements expressed perceived uncertainty due to a lack of information. Mupinga et al. (2006) already found that obtaining course information in advance is of great importance in remote learning. However, the abrupt change from offline to remote learning during the pandemic was unpredictable and this need was not met. As a consequence, many students also expected negative effects on the quality of remote teaching and learning, including performance assessment. It therefore seems imperative to verify whether the measures taken at universities have been able to dispel these concerns in the meantime. The present study thus represents a valuable reference for upcoming success evaluations.

The most frequently mentioned positive effects expected from the transition to remote learning were the saving of time as well as flexibility issues regarding time and work management, the (asynchronous) reception and processing of course materials, choice of learning locations, and in general. These advantages of remote learning had already been highlighted previously (Daymont et al., 2011), but during the current pandemic, these benefits seem particularly important for adequately addressing and compensating challenges in other areas of life, such as those associated with job loss (Aucejo et al., 2020) and new obligations in family life (Ayuso et al., 2020). Hence, universities and lecturers should try to maximize flexibility options during this challenging time. Interestingly, many students also expressed the hope that they will experience an increase in their media- and study-related competences and skills. Indeed, universities where face-to face teaching dominates often lack learning opportunities to acquire relevant competences and skills (Jäger-Biela et al., 2020). However, the participants' hope might be in vain, as the development of appropriate learning opportunities takes time and cannot be realized solely through a quick expansion of digital infrastructure. Further research is needed to evaluate which of the potential benefits of remote learning can be established for higher education in the long term. Many students also expressed hope for progress in digitalization in universities and society and for a better work-life balance due to remote learning. Hence, they identified current weaknesses in the digital infrastructure in Germany (Gilch et al., 2019) and emphasized the long-term potentials of remote learning for their work-life balance. Interestingly, only few statements addressed the protective effects of remote learning regarding SARS-CoV-2, the virus that causes COVID-19. Perhaps this aspect is so self-evident that students did not find it worth mentioning.

When comparing the positive and negative effects, some overlaps are recognizable: While some statements reflect negative expectations regarding the quality of teaching and learning, other statements reflect quite the opposite. University measures must therefore be designed to realize opportunities and mitigate risks in terms of quality. This requires a precise evaluation of the conditions for success and failure in remote teaching and learning, in order to continuously improve ongoing measures. In this context, it seems to be a fruitful strategy to include the students' perspective in the design of digital teaching and learning in the sense of a co-creational process (Lubicz-Nawrocka, 2018). Also, some aspects mentioned by the students are counteractive: While flexibility ranked highly among the positive effects, having to face self-regulation issues were prominent among the anticipated negative effects. These aspects, however, are inextricably linked. Self-regulation is positively related to students' achievements in remote learning and their learning experience (Artino, 2008; Paechter et al., 2010). Hence, universities should implement specific measures to foster the different determinants of self-regulated learning (Boekaerts, 1999) so as to unfold the positive effect of the flexibility provided by remote teaching and learning.

Importantly, the effects mentioned by the students were—on average—personally considered to be highly relevant. Negative effects were rated significantly more relevant than positive effects, although this difference was characterized by a small effect size. Also, master students considered the negative effects as more relevant than bachelor students. This could be explained by the fact that master students already have more established study routines and the pandemic-related change management process might seem more challenging for them from this perspective.

Finally, and as expected, the relevance ratings decreased across the sequence of effects mentioned, corresponding to an ease-of-retrieval effect (Schwarz et al., 1991; Menon and Raghubir, 2003; Wänke and Hansen, 2015). Thus, the particularly important aspects are those that came to the participants' minds first. These aspects should be given special consideration in university measures, and researchers who collect qualitative data via surveys and interviews should be aware of this phenomenon in general.

Limitations

The strength of the present study is based on the collection of immediate student responses to the first nationwide Lockdown in Germany in 2020. Important implications for current and future measures can be derived from the data obtained in this way, which would be difficult to reproduce via a retrospective survey. At the same time, some limitations are associated with this approach:

Methodologically, the rigid sequence of the effects asked about (first negative, then positive) could be seen as a limiting factor. We do not know whether the ratio of anticipated effects would change in favor of positive effects if the participants had been asked about them first or if the sequence had been randomized. The fact that the onset of the pandemic and the unprepared switch to remote learning were accompanied by an overall negative mindset, as documented by many studies from this period (Benke et al., 2020; Cao et al., 2020; Petzold et al., 2020; Wang and Zhao, 2020), argued against both of the latter design options. In general, selecting an entry topic is an inherent challenge of qualitative surveys. Therefore, we deliberately asked about negative effects first to better reflect the prevailing situation regarding the pandemic and the abrupt shift to remote learning at German universities.

Another possible limitation is that our study only addressed pre-course expectations of students. These will not necessarily have been confirmed by subsequent experiences. A continuous development of students' expectations over time and a post-course evaluation were not part of this study. At the time this study was planned and conducted, there was no indication of how long the impacts of the pandemic would last. Remote learning was still in its infancy at many German universities and a clear process was not foreseeable. Students still are confronted with an almost complete transition to remote learning today. It might be too early for a final summative evaluation of these measures, as higher education in Germany is still undergoing a digital transformation process that has been intensified by the pandemic.

Lastly, the results of this study on German students cannot be generalized to the teaching and learning conditions around the globe. Aristovnik et al. (2020) reported that the frequency of students' personal worries during the COVID-19 pandemic varies considerably across continents. Moreover, there might be substantial differences in the rating of specific effects from one university to another, and some factors may strongly depend on the individual lecturers and learners. Based on the present results, future research should take a more nuanced perspective to examine the fit between the skills and needs of individual students on the one hand, and remote teaching and learning interventions during pandemic conditions on the other.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

In accordance with local legislation and institutional requirements, an ethics board approval was not required for this study on human participants. In Germany, as stated by the German Research Association (DFG, https://www.dfg.de/foerderung/faq/geistes_sozialwissenschaften/index.html), the

present survey study did not require the approval of an ethics committee, because the research did not pose any threats or risks to the respondents, it was not associated with high physical or emotional stress, and the respondents were informed about the objectives of the survey in advance. At the beginning of the study, participants were informed that the data of this study will be used for research purposes only and that all data are collected anonymously. Thus, no identifying information was collected. Participants who prematurely abandoned the survey were not included in the analyses and all of their data were deleted from the dataset. Informed consent to participate in this study was provided by clicking a corresponding box, and participation was voluntary in all cases.

AUTHOR CONTRIBUTIONS

TH, AA, and KK designed the study, performed the analyses, interpreted the results, and wrote the manuscript. TH and AA collected the data. KK organized and supervised data collection and acquired funding. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.642616/full#supplementary-material

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Autonomy and Community in Learning Languages Online: A Critical Autoethnography of Teaching and Learning in COVID-19 Confinement During 2020

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During COVID-19 confinement in 2020, there has been a massive increase in learning languages online via a variety of apps, short courses, and as part of higher education on-campus degrees converted to online learning. This study argues that attention to the balance of autonomy and community is vital to successful language learning online. An initial exploration of recent scholarship on autonomy and community in learning languages online validates this approach to evaluating the situation. The specific phenomenon of online language teaching and learning during 2020 at the University of Melbourne is then presented as an autoethnographic case study and analyzed in the context of this research. In 2020, the author participated in online language learning experiences from several different perspectives. As Head of Languages, she led development of a new undergraduate certificate in languages in response to an Australian Federal Government initiative to offer significant subsidies for online language certificates in 2020. As a keen language learner, she enrolled in one of these certificates to study Italian. As a French lecturer, she converted Matters of Taste—French Eating Cultures, a highly interactive and sensory oriented on-campus subject for advanced French students, to online delivery. The autoethnographic work undertaken in this article aims to examine critically the author's experiences of teaching and learning in 2020, assessing the advantages and disadvantages of learning languages online from positions of both teacher and learner. These experiences are triangulated with the academic and administrative leadership and coordination required to produce a schema that relates intentions to outcomes in this particularly challenging context. This study is intended to offer insights that may help language educators reflect on their various roles during COVID-19 confinement. In conclusion, this study demonstrates that negotiating the balance between autonomy and community is (still) the key to learning languages online during COVID-19 confinement in 2020.

Keywords: autonomy, community, online language learning and teaching, autoethnography, sensory education

INTRODUCTION

During COVID-19 confinement in 2020, there has been a massive increase in learning languages online via a variety of apps, short courses, and as part of higher education on-campus degrees converted to online learning (Andress et al., 2020; Dutton, 2020; Rosenbloom, 2020; Sandle, 2020; Silva, 2020; Whitebloom, 2020). With notoriously high attrition rates due to lack of motivation or feedback, online language learning has suffered from a certain stigma in the most respected "sandstone" universities of Australia. This study argues that attention to the balance of autonomy and community is vital to successful language learning online, whether in COVID-19 confinement or not.

Scholarship on autonomy and community in learning languages online validates this approach to evaluating the situation. Since Henri Holec's groundbreaking work on *Autonomy and Foreign Language Learning* was published by the Council of Europe's Modern Languages Project in the late 1970s, (Holec, 1981) the advantages of self-directed language learning, freedom of choice and expression have been emphasized, but the fundamental notion that interpersonal relations, together with community values, were always maintained at the heart of the language learning experience. More recently, the internet has provided more opportunities for autonomous exploration to find language learning communities with shared interests, a desirable adventure that has been likened to "Chasing the Butterfly Effect" (Godwin-Jones, 2018).

The specific phenomenon of online language teaching and learning during 2020 at the University of Melbourne is then presented as a critical autoethnographic case study and analyzed in the context of this research on autonomy and community. I provide a first-person account of my participation in online language learning experiences to offer a critical autoethnography of teaching and learning in COVID-19 confinement during 2020, using personal narrative as method (Wood, 2017). My experiences are drawn from several different roles and perspectives related to learning languages online.

As Head of Languages, I led development of a new undergraduate certificate in languages in response to an Australian Federal Government initiative to offer significant subsidies for online language certificates in 2020. As a keen language learner, I enrolled in one of these certificates to study Italian, in my first experience of online language learning as a student. As a French lecturer with over 20 years' experience in teaching on campus subjects, I embarked on my first online teaching journey, converting a highly interactive and sensory oriented on campus subject for advanced French students to online delivery.

The autoethnographic work undertaken in this article aims to examine critically my experiences of teaching and learning in 2020, assessing the advantages and disadvantages of learning languages online from positions of both teacher and learner. These experiences are triangulated with the academic and administrative leadership and coordination required to produce a schema that relates intentions to outcomes in this particularly challenging context. This study is intended to offer insights that may help language educators reflect on their various roles during COVID-19 confinement. Finally, these insights are tested against the framing hypothesis—that the balance of autonomy and community must be carefully managed to achieve optimal results in learning languages online.

MATERIALS AND METHODS

COVID-19 Contexts: Australia and the University of Melbourne

According to the World Health Organization (WHO) timeline, the first indication that a "viral pneumonia" was sweeping Wuhan, the capital of Central China's Hubei province, was picked up on December 31, 2019 (WHO, 2020). By January 23, 2020, domestic and international travel bans were imposed on Wuhan, and Australia registered its first case of COVID-19 on January 25, a man in his 50s who returned to Melbourne from Wuhan on January 19. When the WHO declared a global Public Health Emergency on January 30, Australia quickly moved to ban foreign nationals entering the country from mainland China, requiring Australians returning home from China to self-isolate for 14 days (Duckett and Stobart, 2020).

From the University of Melbourne perspective, alarm bells were ringing already, as there was doubt as to whether international students from China would be able to begin or continue their studies at the beginning of the academic year on March 2. Students in China with Australian citizenship or permanent residency or student visas were allowed to return to Melbourne but to avoid the 14-day quarantine, many travelled *via* other South-East Asian countries to reach Australia.

On March 2, Australia recorded its first case of community transmission, provoking bans on foreign nationals entering from other countries (Iran, South Korea and Italy) during the first half of March. However, Australians returning on cruise ships increased infection rates and the Formula 1 Grand Prix scheduled in Melbourne for the March 13–15 was the first major event to be cancelled due to fears of further community transmissions. From 15 March, the numbers of national cases began rising rapidly, doubling every day until national action was escalated with Stage 1 shutdowns announced on March 23, Stage 2 shutdowns on March 25 and Stage 3 shutdowns on March 29. Australia closed its national borders on March 20, and the domestic borders of Tasmania, Northern Territory, Western Australia, South Australia, and Queensland were all closed by March 25.

The University of Melbourne, after 3 weeks of classes on campus, directed staff and students to pivot to online teaching and learning from week four, in line with the Stage 1 shutdowns beginning on March 23. Many international students who had travelled back to Melbourne from China and elsewhere returned to their home countries, preferring to pursue their online studies from there. Some international students were feeling threatened by rumors of racism; some were in financial distress having lost their part-time jobs and unable to access any government support; some simply felt safer in their home countries.

Students from interstate found themselves in similar dilemmas—wondering whether to stay in colleges or student accommodation or return to the security of their family homes elsewhere. Although the curve mapping the rise of COVID-19 cases had flattened by the end of April, and in May, restrictions began to ease with the re-opening of some non-essential businesses, a cluster in Tasmania and outbreaks linked to quarantine hotels kept Australian authorities on guard. Universities were cautiously preparing to return to campus with social distancing and masks for semester 2, with the University of Melbourne calling for nominations for on campus subjects, beginning a week later than normal on August 3.

But by August 2, Melbourne was in the hardest and longest lockdown that any Australian city was to experience. In fact, at the time of writing this article, no other city in the world has endured the same level and duration of restrictions. From July 8, Stage 3 restrictions had been re-imposed in Victoria due to a spike in cases linked to hotel quarantine breaches, and on August 2, a 42-day Stage 4 lockdown was instituted, including an 8 pm–5 am curfew and travel limit of 5 km from home. A further 42 days of Stage 4 confinement with very slight modification to hours of curfew ended on October 26, the final week of semester 2 for University of Melbourne teaching staff and students, but with swotvac (revision week) and exams looming, and Stage 3 restrictions still in place, students could not yet enjoy their freedom. Finally, on November 23, Melbourne came out of lockdown.

COVID-19 Language Learning Initiatives: Australia and University of Melbourne

On April 12, the Minister for Education, The Hon Dan Tehan MP, released the Higher Education Relief Package designed to slash the cost to study short, online, courses offered by universities and private providers to help Australians retrain in priority areas such as nursing, teaching, health, IT, science and languages (Tehan and Cash, 2020a). New customized Undergraduate Certificates comprised of 2–4 units of study to be completed between May and December 2020 would be available to Australian students for either AU$1,250 or AU$2,500. The proposed Undergraduate Certificate in Languages (4 units) was in the lower cost category ($1,250) which represented less than half the usual cost of 1 unit of languages study at the University of Melbourne.

Subsequently, Tehan launched the Job-Ready Graduates Package proposal on June 19, to lower fees in some subjects—mostly aligned with the areas subsidized in the Higher Education Relief Package—and raise fees for Humanities and Social Science subjects (not including languages), Economics, Law and Medicine (Tehan and Cash, 2020b). After much debate, the package was passed by the Senate on October 19 (Tehan, 2020). The clear message is that the Australian Government is encouraging an instrumentalized approach to language learning at universities with 100% online delivery.

The University of Melbourne does not espouse this instrumentalized assessment of languages nor this 100% online approach to language learning. Pre-COVID-19, none of its languages offered 100% online delivery, and following the 2009–2013 Languages Curriculum Reform, all languages integrate language and culture subjects at all levels. (Martinez-Exposito, 2011). However, there was interest in leveraging these initiatives to foreground the online language learning that the University of Melbourne would be offering—exceptionally—in 2020. It was therefore decided that the University of Melbourne would explore possibilities for establishing a 100% online Undergraduate Certificate in Languages with 4 units for delivery from May-December 2020 only. As mentioned above, the 100% online delivery of all subjects was already guaranteed in order to honor commitments to international students to continue their language majors, whether or not Melbourne's lockdown continued, so it was deemed possible to create a package of 4 units to comply with the conditions of the government-subsidized Undergraduate Certificates in 2020.

COVID-19 Teaching and Learning Experiences: My Pathway Outlined

During 2020, I was one of the first University of Melbourne teaching and learning staff to be directly impacted by COVID-19 due to my role as co-coordinator of a summer intensive subject from 10 to 21 February: EURO20008/30007 A Taste of Europe: Melbourne Intensive. Around 40 of the 180 students enrolled were in China, unable to return to Melbourne to take the subject. All classes were still scheduled on campus at this stage, with no online options for tutorials or workshops. Before any suggestions or requirements to pivot to 100% online delivery at the University of Melbourne, we created and coordinated a new online tutorial stream for students in China, of which eight remained enrolled and successfully completed the subject, despite being in lockdown in Wuhan and other COVID-19 affected cities.

In Semester 1, I coordinated and taught all lectures and tutorials in French for FREN20013/30015 Matters of Taste: French Eating Cultures with 75 advanced French students. One student from China returned home and did not complete the subject. As with all University of Melbourne Semester 1 subjects, I commenced 100% online teaching beginning the week of March 23.

From mid-April—December, I led the creation, administration and delivery of five Undergraduate Certificates in Languages (French, German, Italian, Spanish, and Russian). In July, I enrolled as a student in the Undergraduate Certificate in Languages (Italian), from which I graduated in December.

In addition, I coordinated a core French language and culture subject at advanced level French 6: The Fine Art of French Conversation in Semester 2 with 165 students.

The event that sparked this critical autoethnographic project was a request from *Pursuit*, the University of Melbourne's multi-media platform for showcasing the latest research and opinion from academics, to write a piece on learning languages online, given the recent surge in general interest. I spent the month of April researching and writing this article, while concurrently developing the Undergraduate Certificates, and teaching Matters of Taste, and realized that I, like so many others,

would like to plunge into the experience of learning a language online during the COVID-19 crisis. My interest in critical autoethnography had already been piqued through working with anthropologists at the University of Melbourne and especially in supervising a PhD Candidate Sally Guilloux-Cooke in her autoethnographic and animation work on understanding creolization on Reunion Island. Sally sadly passed away on April 22, 2020 and I would like to dedicate this article and research to her memory.

The *Pursuit* article I wrote "Learning a Language at Home: You are Not Alone" foregrounded the dilemma of forced autonomy and desired community in learning languages online (Dutton, 2020). It caught the eye of Rhoda Sherman, guest co-editor of this special issue of *Frontiers in Psychology* on "COVID-19 and Beyond: From (Forced) Remote Teaching and Learning to 'The New Normal' in Higher Education." She suggested submitting an abstract on the topic, and I saw this as an opportunity to explore further the themes and scholarship that could not be included in the mainstream *Pursuit* article, enhanced by the critical autoethnography that I wanted to undertake on the teaching and learning experiences I was in the process of curating.

These teaching and learning experiences are explored in more detail using critical autoethnographic methods, as described below.

Critical Autoethnography

Autoethnography has, arguably, always been critical. As a qualitative research method, the meanings and motivations of autoethnography have nevertheless evolved since the term first appeared in the 1970s to describe studies of cultures from within, from an "insider" perspective (Hayano, 1979). During the 1980s and 1990s, a shift towards cultures of storytelling and introspection for more reflective practices resulted in a broadening of the definition to include research involving self-observation and investigation within an ethnographic field—essentially moving beyond the myth of objectivity and towards subjectivity as a valid perspective. By the 2000s, academics from a wide range of humanities and social science disciplines were employing autoethnographic methods which, while privileging autobiographical and personal narratives, should still connect to broader questions of cultural, social and political significance (Ellis, 2004). The publication of special issues of journals (*Journal of Contemporary Ethnography,* 2006) and methodologies (Chang, 2008) paved the way for handbooks and edited volumes published by Oxford (Adams et al., 2015) and Routledge (Bochner and Ellis, 2016), thus consecrating autoethnography as a recognized qualitative research method.

Critical autoethnography strives to take this "cultural analysis through personal narrative" to another level, mobilizing "multiple standpoints to situate their stories and lives to call out positions of privilege and expose moments of vulnerability" (Boylorn and Orbe, 2014: 17, 18). In recent times, critical autoethnography has been used effectively to conduct research in marginalized, vulnerable communities where researchers, through reflexivity and introspection,

study the Self as participant, acknowledging that as members of a dominant culture, they interpret the "facts" through their own sociocultural circumstances (Tilley-Lubbs, 2016). This method has proved fruitful for academics to focus on analyzing their own teaching and learning contexts, practices, experiences, and issues from sympathetic positions, such as in the Special Issue of the *International Journal of Multicultural Education* on "Critical Autoethnography in Pursuit of Educational Equity" (2017). The editors make the salient point in their introduction: "Education, in its many forms, is an institution that mirrors the society around it, including its patterns of privilege and marginalization. Personal stories of living through and being a part of these patterns highlight for readers the ways we are all affected by and affecting institutionalized power and privilege." (Marx et al., 2017: 2). The articles in this Special Issue include critical autoethnographies from both student and teacher perspectives, using individual and collective storytelling, and speaking from positions of relative advantage and disadvantage in the institutions described.

Several autoethnographic articles related to education have also been published in *Frontiers in Education* (Kappert, 2020; Fuller, 2020) and *Frontiers in Psychology* (Buckley, 2016; Langseth and Salvesen, 2018). In particular, Annette Kappert's critical autoethnography on female black and minority ethnic educators in British higher education institutions eloquently defends autoethnography's subjectivity, accuracy, vulnerability, reliability, and validity as a qualitative research tool for understanding educational paradigms and problems (Kappert, 2020).

In this article, I will draw on the justifications proposed by Kappert and others to center my Self as a site of enquiry (Marx et al., 2017). My ambition to translate the personal into broader research results in online language learning scholarship goes beyond certain projects that envisage autoethnography as an end in itself, to express fieldwork evocatively (Ellis and Bochner, 2006). I follow Leon Anderson's approach in being "committed to developing theoretical understandings of broader social phenomena" (Anderson, 2006). As Langseth and Salvesen note, "The strength of autoethnography, as we see it, is that the researchers can have a full, embodied understanding of the culture under scrutiny while at the same time maintaining a critical distance from the participants' meanings and statements about their motives, values, and goals." (Langseth and Salvesen, 2018). As I analyze my own experiences of teaching and learning languages online during COVID-19 confinement, I am constantly questioning and challenging my own and others' representations of these experiences. While this process does offer greater "understanding", I hesitate to state that it is a "full, embodied understanding" given the multiple natures of my roles as teacher and learner as well as providing strategic and administrative leadership. I therefore choose to express the outcomes of this critical autoethnography as "insights" rather than results or findings, following similar preferences for non-scientific terminology outlined by Kappert (2020) and Chang (2008).

INSIGHTS

Data generated through the reflective process constitutes most of the material that leads to the insights presented here. I wrote detailed notes on the process of pivoting to online language teaching, some of which were shared and workshopped with colleagues in email correspondence and meetings. My experiences of language learning online were recorded in weekly learning tasks and periodic assessment submissions, as well as my own personal notes. Student feedback and communication, interaction with colleagues at institutional and personal levels, students' participation and assessment results, and (re)enrolment statistics also serve to complement these insights. This section presents a series of three scenarios, each beginning with an evocative autoethnographic passage, followed by critical reflective analysis, then insights gleaned from the process.

MATTERS OF TASTE: FRENCH EATING CULTURES

Collaborative Sensory Education

Our last Matters of Taste classes before the lockdown were not in stuffy classrooms, but outside on the South Lawn in the warm autumnal sunshine. As increasing community cases of COVID-19 and rumors of restrictions were causing consternation, several students had expressed concern about our crowded conditions with 25 students elbow to elbow in an airconditioned classroom. Performing our first pivot, our *plein air* tutorials turned out to be an excellent forum for discussion of both our reading on the infamous French chef, Vatel, and the forthcoming period of insecurity and ambiguity. We also discussed how our teaching and learning experience would be transformed by compulsory online delivery.

Matters of Taste is an elective subject taught and assessed in French in which students examine the elaboration of normative codes relating to food and wine and the emergence of gastronomy as an expression of cultural dominance and identity. They also study challenges to bourgeois cuisine and gastronomy as have been experienced since at least the mid-20th century, resulting from the colonial history of France and globalisation. Collaborative sensory education complements traditional pedagogical practices—analyzing readings, unpacking concepts, contextualizing challenges—for exploring socio-historical gastronomic phenomena and their afterlives.

During the first 3 weeks of semester, 75 students enrolled in three groups had enjoyed the "embodied enculturation" that collaborative sensory education can offer (Thyssen and Grosvenor, 2019). Every week I would bring in tasting samples that illustrated an aspect of our learning, starting with two soup stocks showing medieval versus classical French culinary traditions, asking students firstly to identify the 10+ ingredients in each, then articulate the differences (medieval = sweeter, spicier, fruitier flavors; classical = earthier, greener, vegetable flavors), to conclude that geopolitical influences dictated both ingredient availability and taste trends during these historical periods. Enriching vocabulary and stimulating conversation in French, these collaborative sensory education sessions have been an integral part of my language and culture teaching over the past 10 years across various subjects.

In week 4, the first week of lockdown, we were scheduled to taste wines together as part of our study of sensory memory and nostalgia. Instead, I pre-recorded the weekly lecture, a video clip on wine tasting and another on making madeleines in my home kitchen, presenting new specialized French vocabulary and an introduction to Proust's use of this classic French cake to launch into his childhood reminiscences of *A la recherche du temps perdu* [In Search of Lost Time]. For our first classes *via* Zoom, several students showed up with a glass of wine, and some with madeleines, in an attempt to continue our collaborative sensory education on an individual scale. Our collective nostalgia for on campus classes was immediate and poignant.

It was during this first online class that I experienced my most memorable ice-breaking activity—ever. As part of the wine topic for the week, I asked students to watch the film *Ce qui nous lie* [Back to Burgundy] (2017) by Cédric Klapisch. There is a scene at the end of vintage where all the vineyard workers sing the traditional "Ban bourguignon"—a well-known melody with the only words being "lalalalalalalalalèèèra", accompanied by swivelling hand gestures at head height and clapping (https://www.youtube.com/watch?v=2Q6ST9Y-Sfs). After explaining how many times I had sung this "Burgundian hymn" while undertaking research in the region, I encouraged the students to join in singing it with me. Every student had their cameras and microphones on and in big and little voices, each group sang along with me, doing the hands too, as a grand and absurd finale to their first zoom tutorial in Matters of Taste. After that experience, the barriers to online expression were down and anything was possible. . .

Negotiating Times, Spaces and Needs

We had collectively decided to recast our on campus tutorials that usually extended over 1.5 h for 25 students, to synchronous online tutorials *via* Zoom for 2 × 45 min with half of each class attending at a designated timeslot so as to promote intense discussion and interaction while limiting "dead" screen time. Our online classes seemed to be working well but to probe deeper, I asked students to complete an anonymous online quiz during the mid-semester Easter break to assess how their online learning was progressing and whether we should reinstate the longer classes with more students. Around one third of students responded to the quiz with generally positive comments and equal numbers preferring to keep the shorter 45-min online tutorials versus extending the tutorials to 1.5 h again. As a compromise, I made the remaining tutorials for the semester 1 h dedicated to essential learning outcomes for all 25 students in a group, with an additional 30 min for optional further conversation on the topic and social interaction in French.

In response to student requests for another informal space for broader interpersonal connections, I initiated an online film night and drop-in sessions for discussing individual and collective issues related to our subject and studying French in general. While these opportunities were not as actively subscribed as

expected, there were great connections formed during these online meetings, which have led to further collaborations (see below).

In the on campus version of Matters of Taste, one of the assessment tasks mirrored the collaborative sensory educational experience I initiated in the first weeks of semester. During the final 3 weeks of semester, all students normally present a research project focusing on a French or Francophone dish, regional speciality, or local product, offering samples of the selected subject to share with the group to enhance engagement through embodied enculturation. The online teaching and learning experience did not allow for such convivial and collective sensory education, but pre-recorded video clips by students demonstrated deep commitment to continuing their sensory education on an individual scale. Historical and cultural research complemented one student's demonstration and tasting of the Galette des rois; another student, dressed as a Dijon farmer, made mustard from seeds, wine and honey; another recounted their experiences at the legendary Bouillon Chartier in Paris, tracing the history and impact of this popular precursor to the Parisian fine dining restaurant; another searched out *les mères lyonnaises* in an effort to counter the masculine hegemony of French gastronomic heritage; another indulged their fascination for *merroir*, the marine version of *terroir*, to study the culture of oysters and traditions of their consumption in France; and a Bougna from Kanaky-New Caledonia, Couscous royal from Morocco, and vanilla from Reunion Island featured alongside Veuve Clicquot from Champagne, Château Latour from Bordeaux, and Chartreuse from the Grande Chartreuse monastery near Grenoble. Students were asked to watch at least one of their classmates' videos and write a constructive critique of the information presented and filming style. Their evaluation and appreciation of each other's work was inspiring and heart-warming, making comments on their achievements and empathizing with shared difficulties in presenting for an absent audience.

The subject was clearly successful in spite of the modifications required for online learning. Only one student from China left the subject after classes were moved online, explaining that they preferred to return home and delay French Studies until on campus teaching was reinstated. Another student facing considerable financial difficulties and some learning barriers managed to overcome both during the semester to finish with a solid grade. One student did not complete all pieces of assessment and therefore failed the subject. Otherwise, students' participation and results were considerably higher than average with an overall mean of 78%.

Ongoing Connections and Insights

Two positive insights stand out for me in relation to taking Matters of Taste from an on campus to an online subject.

Firstly, for successful online teaching and learning, it is vital to create a space for community beyond the formal teaching and learning space, which then leads to ongoing connections and deeper relationships. Students who entered this space excelled in their assessed work and have remained in contact with me throughout the year. Our ongoing communications include

exchanging film recommendations, food and wine tasting experiences, recipes, and general catch-ups. Several students have contacted me for references, advice about their future work and postgraduate studies, enrolling in other subjects I teach, and other university-related issues. I was invited to present "my life as a French Professor" at the Student French Club, and one of the most engaged Matters of Taste students has secured an internship with the French-Australian Chamber of Commerce and Industry in Victoria with my support. There is a true sense of community that has evolved from this shared experience of adversity and achievement. Many students have expressed that Matters of Taste was the best online subject they have studied, indeed some said that it was what encouraged them to continue with their studies. One student contacted me specifically to say that they had never before felt as supported and encouraged to participate in a subject at university. This reaction completely contradicts my apprehensions about disconnectedness in teaching and learning languages online—an outcome for which I am very grateful, most of all to the students with whom I shared the Matters of Taste experience.

Secondly, sensory education can be facilitated in the online space, leading to embodied enculturation in both individual and collective contexts. I was fundamentally challenged by the impossibility of continuing the collaborative sensory education I wanted to encourage through on campus tastings and collective analysis. But students were innovative and driven to explore their own sensory education via their research projects and weekly interactions during tutorials. Their autonomous actions were surprising and enlightening, ranging from curating their own tasting experiences to sharing their sensory experiences in tutorials. I only realized in hindsight the value of the shared vocal, auditory and gestural experience of singing the "Ban bourguignon" together in the first online tutorial, as a collective sensory experience that was nevertheless dramatically different from the collaborative winetasting that I had planned. This ice-breaker allowed us all to consider more diverse modes of expression in the online space, and eventually re-negotiate our time, space and needs.

THE UNDERGRADUATE CERTIFICATE IN LANGUAGES

Languages in the Spotlight

Languages are usually in the spotlight for all the wrong reasons. Not enough students, program closures, lack of institutional support, are the expected headlines. Government encouragement through radically reduced fees for an accessible Undergraduate Certificate in Languages came as a shock on April 12. My new role as Head of Languages put me in a position to decide whether to lobby for creation of an Undergraduate Certificate in Languages or leave it to other institutions to fulfill the perceived need for intensive online language learning. Some colleagues were immediately in favor. Others were not. I could see the advantages of profiling our language learning programs at a national level. These certificates would be

promoted *via* a dedicated section of the Australian Government courseseeker.com.au website, consulted by millions of prospective students. It would take some extra work with the Convenors of the Languages programs at a time when there was already enough extra work in converting our on campus subjects to online delivery. But in a climate of crisis when absent international students were dropping our overall numbers, the Undergraduate Certificate was also seen as a bid to increase flagging enrolments for 2020.

To comply with the Government regulations to provide a suite of 4 subjects between May and December 2020, we needed to offer an *ab initio* language and culture subject as an online winter intensive—3 weeks in July—then three subjects during Semester 2. French 1 and Italian 1 were already in the 2020 handbook as winter intensives, and German, Russian and Spanish staff saw potential for recruiting new students both from the Undergraduate Certificate and the general student population by offering their beginners subjects in online intensive mode in July. This *ab initio* online winter intensive as a predetermining condition for language progression over the period could not feasibly be considered by staff in the Asia Institute due to heavy workloads, so they were unable to offer their languages in the Undergraduate Certificate.

The Semester 2 study plan then included the level 2 core language and culture subject, and either a cultural studies subject taught in the target language (i.e., French and Francophone Cultural Studies) which was usually for more advanced students, or a European Studies subject: Language and Society in Europe, taught in English. The final compulsory subject for all students was Languages at Work, a work-integrated-learning subject with placement component using the target language. While the two core language and culture subjects at levels 1 and 2 were first-year subjects and therefore posed no particular problems for entry level students within their first 6 months, the Cultural Studies subjects and Languages at Work were both aimed at second-year students with higher levels of language and cultural competence. Participating staff nevertheless agreed that there would be scope for catering teaching and learning and assessment to the needs and competency levels of these incoming Undergraduate Certificate students, and so the new course required no completely new subjects, simply recasting or alternative delivery of existing subjects.

With the support of the School of Languages and Linguistics leadership, we took the Undergraduate Certificate in Languages (French, German, Italian, Russian and Spanish) through the various levels of the University hierarchy of approvals. It was a risky play in a tight timeframe and there were many delays due to the rigorous processes for creating new courses—which usually take between 18 months and 2 years. However, the certificate was validated and advertised on the courseseeker.com.au website within 5 days of the final due date for applications, which was 5 days before the winter intensive *ab initio* subjects began. We received over 100 applications, of which less than half were accepted, and just over 20 students enrolled across the five language certificates.

So much work by so many people for so few students.

It felt like a setback rather than a victory, and I was one of the lucky few who made it through—just. . .

Uncritical Mass

As one of the creators of the Undergraduate Certificate in Languages, my pathway through the enrolment process was undoubtedly facilitated by 20 years of experience in the institution and knowing who to contact when things went wrong. A professorial colleague who also applied for entry into the Undergraduate Certificate likewise recognized her advantaged position in the system. However, both of our applications were initially rejected due to lack of proof of our previous degrees—impossible to obtain in the turnaround time required. Thankfully, the University acknowledged that our academic positions in the institution could serve as proof of our intellectual standing!

For the 20 other students, it was important to communicate the urgency of accepting their offer, enrolling immediately, setting up a university email address, completing a placement test to ensure no prior knowledge of the language to be studied, and the need to commence four-five hours of classes per day for 3 weeks beginning on Monday of the following week. The admissions team telephoned each of the students, leaving messages, and I followed up with texts and calls to explain the intricacies of the teaching and learning experiences they had signed up for.

In our conversations, I was struck by their uncritical attitudes, their patience and forbearance with the unfamiliar administrative processes required, and their willingness to change their schedules at short notice to take advantage of the online language learning experience on offer at the University of Melbourne. For the most part, these new students were highly qualified professionals—lawyers, merchant bankers, teachers, communications experts, medical specialists, gallerists, etc.—who had leapt at the opportunity to study a language online during a COVID-19 induced lull in their otherwise extremely demanding working lives. Their motivations were as diverse as their locations—students were connecting from Sydney and San Francisco, as well as the Philippines, with regional Victorian and rural Australian students also represented. Some students were stranded in Melbourne having returned from high-profile international careers in Liverpool and Hong Kong. All of them shared a commitment and passion for learning their chosen language online via the prestige community constituted by the University of Melbourne. There was a clear attraction to studying at the "Number 1 ranked university in Australia", and several students referred to the particular language and culture subject descriptions as one of the principal drivers for their decision to apply for the Undergraduate Certificate in Languages at the University of Melbourne.

Feedback from students both during and after studying the Undergraduate Certificate in Languages has been overwhelmingly positive. Several students have elected not to exit the program with this qualification, upgrading to either a Graduate Diploma in Arts (Language) or continuing with their language studies at the University of Melbourne via other courses. The quality and commitment of the 20 students who did enrol in the Undergraduate Certificate in Languages have proved to be rewarding for teaching staff as well as other students in the subjects.

Administrative, Marketing and Pedagogical Insights

The insights drawn from developing the Undergraduate Certificate in Languages relate to administrative and marketing perspectives as well as pedagogical concerns.

The administrative load for creating and delivering the Undergraduate Certificate in Languages in such a tight timeframe for so few students was onerous and unsustainable for all concerned. However, the marketing opportunities and market research provided were invaluable. The visibility and targeting of these programs were measurably greater in terms of reach and impact than most other paid marketing strategies for language studies. Market research based on hits and views demonstrated significant interest for intensive online language learning certificates in French and Russian, with lesser but still considerable levels of interest in Spanish, Italian and German.

The pedagogical experience was of excellent quality, but potentially much more demanding than usually expected in such as program. The high calibre of students accepted into the Undergraduate Certificate in Languages allowed for engagement at an appropriate level in the second-year subjects (Cultural Studies and Languages at Work), whereas I suspect entry-level students with no prior academic experience would have difficulties in coping with the more advanced subject material and challenging language competencies required at such an early stage of their studies. The cohort's capacity for autonomous learning combined with their maturity also promoted good community-building strategies to connect with other students both within the Undergraduate Certificate program and beyond.

THE UNDERGRADUATE CERTIFICATE IN LANGUAGES—LEARNING ITALIAN ONLINE

Delights of Code-Switching

As an academic specialized in language teaching and learning, I consider myself well-versed in the theories and practices of code-switching. Linguists generally define code-switching as occurring when speakers use two or more languages, dialects or varieties in the same conversation without any apparent effort (Gardner-Chloros, 2009). In recent years, behavioral code-switching has been more closely observed, especially in racial and gendered contexts, with special attention on the psychological costs that constant code-switching can entail (McCluney et al., 2019). In my case, from July to December 2020, I was constantly code-switching between teacher and student, attempting to find a space in which I could be free to make mistakes and learn from them like any other student, and yet also support and respond to the expectations my colleagues inevitably placed on me as a fellow teacher.

My enrolment in the Undergraduate Certificate in Languages (Italian) was at first, a folly that I had no delusions about being able to maintain. For the first few days of the Italian 1 online winter intensive, I decided every evening to withdraw and yet every morning was excited to login to our classes. I learnt so

much, so quickly, and enjoyed every minute of it so that by the end of the first week, I knew I had to continue despite personal and professional advice that I was taking on too much. And I learnt so much more than just Italian language and culture—my teacher was a colleague I have known for over 20 years whose talents and expertise in language teaching made so much sense to me from the student perspective. Their nurturing and sometimes self-deprecating positioning produced neither disrespectful nor exploitative reactions in the students. Instead, by emphasizing a compassionate and vulnerable approach in their teaching style, they co-opted the students into an intimate community of trust, which is a fundamental advantage in building confidence in language learning and one that is harder to achieve in the online classroom than in on campus classes.

Most of the time, I was just Jackie, *una studentessa d'italiano*, but sometimes it became clear that I was not just a student of Italian, but a teacher of French as well. I could not help myself asking other students who had learnt French all through secondary school whether they were studying French at university. When they replied: no, it was too hard to get good marks in advanced French, I was interested, storing the information for later conversations with colleagues. Of course, like me, they found their background in French grammar and vocabulary an advantage in learning Italian. An unfair advantage? Well, yes, in a sense.

Our teacher told us about everything—all about their studies, travels, family and children—subjects we'd never discussed in the corridor in such depth or frankness. In return, I submitted essays in Italian about my childhood experiences, my dreams, my family history and my fears, exposing myself as I never normally would to colleagues in English or French. I felt completely vulnerable on one hand, and then my teacher would email me to ask a question about languages strategy or some other administrative approval and the scale would slide again.

The other students embraced me into their community, not expecting me behave like a teacher until it was asked of me. For example, other students would lead the small group activities, freely correcting my pronunciation or errors, but if advice was needed on enrolling in subjects or getting approval for a course, they would not hesitate to ask me for help—such as an introduction to the Convenor of Japanese, or a course plan for advanced French. They code-switched even more easily than I did. We compared answers and marks and experiences and recipes. I understood where the international students were coming from and going to, how they lived in Melbourne with a parent, or a sibling, or all alone, wishing to return home. We joined facebook groups and organized study groups, revised together and got nervous about the oral exams. Several of these students are enrolled in the subjects I teach next year—what strange and wonderful on campus reunions they will be!

Challenges of Code-Switching

Italian 1 and Italian 2 flowed one into the other, with the same teacher and some of the same students—and a true feeling of community in diversity. Italian Cultural Studies and Language at Work were very different experiences. In both subjects, I was

mostly working in small groups with other students enrolled in the Undergraduate Certificate. The high-achieving cohort was more demanding, less diverse, than in the other classes, and I was more obviously a reference point as the main administrative contact for these students. I felt responsible when they complained that there was too much work in the subject, or that it was too hard for our level. I agreed, suggesting strategies for making the tasks more manageable. However, their ingrained work ethic and competitive approach seemed to override their perceived shortcomings and both their individual presentations and group projects appeared of very high quality.

I agree that reading Petrarchan sonnets, Machiavelli's *Il Principe* and Bocaccio's *Il Decameron*, comparing the Renaissance and contemporary Italian used, as we were asked to do in Italian Cultural Studies, are not really tasks for beginners. But they were feasible activities for the more advanced students in the other tutorial, and we could read the texts in English translation and write our essays in English or Italian, maintaining only our oral presentations in Italian. I certainly learnt a lot in this subject and my code-switching between student researcher and academic researcher may prove further challenging. I am currently writing an academic article comparing Machiavelli's and Thomas More's visions of enlightened leadership, part of which was submitted as an essay for Italian Cultural Studies.

Languages at Work was the real test in terms of code-switching—both behavioral and linguistic. Both teachers marking my work were also tutors that I directly supervise in other subjects. The partner organization with which I was working on a group placement project, the Australian Multilingual Writing Project (australianmultilingualwriting.org), is directed by a close friend and colleague of mine. There were various questions around ethics and assessment that were resolved intelligently and reasonably, but this subject was the most challenging for me in terms of negotiating autonomy and community. With only three 1-h tutorials during the entire semester, the rest of our time was supposed to be spent working with our group and partner organization. However, there was no real opportunity for a "placement" given the online nature of the project and limited interaction with the partner organization. Our group was incredibly dynamic, smart and creative—all equally motivated and yet some were prepared to take on greater challenges—with commensurate time commitments—than others. Our project to each interview a selected poet published in the Australian Multilingual Writing Project journal issues about their code-switching ideas and practices was fascinating and rewarding work. Transcribing and editing the interview for publication on the website was not. For me, this subject definitely involved a very high workload, no specific language skills enhancement, and it was more difficult for me (and several other students enrolled in the Undergraduate Certificate) to see the benefits of taking this subject. However, students who chose this subject as part of their study plans clearly enjoyed this subject and drew much satisfaction from completing the projects using higher levels of language skills. Essentially, there was not enough autonomy, too much community interdependence to make this subject a good fit for my learning needs.

Professional Development Insights

Enrolling in the Undergraduate Certificate in Languages (Italian) is the best personal and professional development for language teaching and learning I have ever done. It has helped me understand the University systems and cultures from the student perspective, and also to recognize cultural differences in ways of teaching and learning European languages, as in the Italian vs. French experience.

The delights and challenges of code-switching have become abundantly clearer to me and I have observed and developed better strategies for accepting and negotiating professional slippage between coordinator, teacher and learner roles.

Learning a language online is enriching, exciting, and enabling if a balance between autonomy and community are maintained.

DISCUSSION

Rather than discussion points, this critical autoethnography poses projection points. Each of the three scenarios that contributed insights to this study require further action for future projections.

Offering sensory oriented subjects like Matters of Taste: French Eating Cultures for 100% online delivery is now a proposition that I can envisage and would recommend to others, despite my initial hesitations. What is lost in the lack of collective sensory educational activities can be gained through autonomous and spontaneous acts of sensory exploration and awareness. However, another sensory oriented subject that I coordinate and teach, Wines of the World, has been twice cancelled due to the impossibility of on campus delivery in July 2020 and February 2021. It is scheduled to be offered 100% on campus as the sensory and fieldwork components represent 50% of classwork and assessment. This percentage of collaborative sensory work cannot be compensated for with individual or autonomous sensory work. I therefore identify limits as to what kinds of sensory oriented subjects can be delivered in 100% online modes.

The Undergraduate Certificate in Languages will not be offered again in its current format. The experiment was successful in terms of marketing, market research and outcomes for the students enrolled in the 2020 delivery of the programs in French, German, Italian, Russian and Spanish. Looking forward, we can project that an Undergraduate Certificate in Languages that also includes the languages taught in the Asia Institute (Arabic, Chinese, Indonesian, Japanese and Korean) with a sequence of 4 units in language and culture core courses over 2 years part-time could be very attractive both to our current students and to students who wish to study only a language at the University of Melbourne.

Learning a language online myself by enrolling in the Undergraduate Certificate in Languages (Italian) has been an invaluable lesson in determining how the balance of autonomy and community can influence the outcomes of the experience. The intensity of the community experience in Italian 1 and 2 was nurturing and balanced out by autonomous activity and assignments, whereas the Languages at Work experience of a small, outcome-driven group without significant autonomy or interaction with others outside the group, proved less fruitful in terms of language learning or cultural enhancement in Italian.

Somewhere in between, Italian Cultural Studies provided a balance of autonomy and community, though the community was limited by reduced language competency in the Undergraduate Certificate in Italian cohort versus the more advanced Italian students.

These language learning experiences in Italian coincide with and confirm projections related to teaching online in French in Matters of Taste. The best balance of autonomy and community can be achieved through creating a harmonious and trusting community within the formal class, and informal smaller groups for increased levels of exchange outside the formal class.

CONCLUSION

In conclusion, this critical autoethnography demonstrates that negotiating the balance between autonomy and community is (still) the key to learning languages online during COVID-19 confinement in 2020.

Diverse experiences of teaching and learning languages in the ever-changing COVID-19 context at the University of Melbourne show that perceived barriers to successful delivery, such as the absence of collective sensory education or communicative group work, can be overcome if the right balance of autonomy and community is achieved.

Formal synchronous classes with flexibility in duration and delivery style, complemented by informal meetups and group work for revisions, provide clear positive results in teaching and learning languages, according to this study.

Critical autoethnography methods were fundamental and essential to gather the insights and projection points presented in this article. It is hoped that this work may help language educators reflect on their various roles during COVID-19 confinement.

Finally, nothing compares to "walking a mile in their shoes" when it comes to understanding students' perspectives and needs regarding online language learning. This reflective experience was invaluable in so many ways, and has shaped the way that I am now recasting teaching and learning experiences for online and on campus language students.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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Psychology Doctoral Program Experiences and Student Well-Being, Mental Health, and Optimism During the COVID-19 Pandemic

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In a sample of 916 doctoral students from 144 universities across the United States, we examined psychology graduate students' experiences in their programs, as well as their mental health, well-being, and optimism during the onset of the COVID-19 pandemic. In a path model, we found that students' psychological experiences in their programs (i.e., social belonging, threat, and challenge) were associated with better mental health and well-being, which in turn was associated with greater optimism about the future during the COVID-19 pandemic. These findings were also corroborated in students' open-ended responses regarding how COVID-19 has impacted their lives. Findings varied by racial, gender, and sexual identities, as racial minorities, LGBTQ+ students, and women expressed more negative psychological experiences in their programs. We outline suggestions for graduate programs to support their graduate students, which include facilitating social connection, providing encouragement, and emphasizing students' well-being over their productivity as the current pandemic persists.

Keywords: well-being, mental health, optimism, graduate students, COVID-19

INTRODUCTION

Graduate students tend to feel overworked, underpaid, and stressed (Hugo, 2017), and also report lower well-being and poorer mental health than the general population (e.g., Willyard, 2012; Evans et al., 2018). These disparities may be exacerbated during the coronavirus (COVID-19) pandemic due to increases in financial stress and lower access to resources (Zahneis, 2020). Social distancing guidelines and the use of remote learning could also increase feelings of social isolation and loneliness (Killgore et al., 2020; Luchetti et al., 2020), as graduate students continue their studies. Due to these additional stressors, it is important to understand how graduate students can cope and remain resilient during this time. Since prior research has shown that optimism is beneficial in times of difficulty and uncertainty (e.g., Fontaine et al., 1993; Auerbach et al., 2005; Yang et al., 2020) and since graduate students spend a significant amount of their time dedicated to their studies (Lauchlan, 2019), understanding how graduate programs can help students maintain their optimism during tumultuous times such as the COVID-19 pandemic is of crucial importance.

To better understand the impact of graduate programs on their students in the midst of the pandemic, we investigated how graduate students' psychological experiences in their program (i.e., social belonging, threat, and challenge) impacted their mental health, well-being, and optimism about the future during the COVID-19 pandemic. We placed a particular focus on optimism, as

it may be a crucial source of resilience for students while they navigate novel challenges during the pandemic. Furthermore, we investigated the impact of social identities (e.g., race, gender, and sexual orientation) on these variables, as students from historically marginalized backgrounds may face additional challenges in graduate school and during the pandemic. For example, research has shown that BIPOC (Black, Indigenous, and People of Color) students in particular report lower belonging in higher education (e.g., Miller and Orsillo, 2020) and are more likely to experience a disproportionate burden during the COVID-19 pandemic due to existing racial inequities (Croucher et al., 2020; Oppel et al., 2020). In sum, we aimed to investigate the psychological state of graduate students during the pandemic, in recognition of pre-existing stressors inherent to the graduate school experience as well as the additional stressors that those from traditionally marginalized social groups may face. Our intention was to highlight the important role that graduate programs can play in maintaining both the mental health and the academic success of students during troubling times.

PSYCHOLOGICAL EXPERIENCES IN ACADEMICS

The type of experiences a student faces in their academic environment exert a great influence on their performance, mental health, and well-being (e.g., Walton and Cohen, 2007; Alter et al., 2010; Cook et al., 2012; Dennehy and Dasgupta, 2017). In the current study, we tested whether individual differences in academic experiences graduate students have in psychology programs impact their mental health, well-being, and optimism during the COVID-19 pandemic. Additionally, we expanded upon previous research by testing whether students from traditionally underrepresented backgrounds (in terms of gender, sexual orientation, race, and ethnicity) reported different levels of these academic experiences.

Social Belonging

Humans need social connections to thrive (Baumeister and Leary, 1995). In academic environments, members of socially stigmatized minority groups may feel uncertain of whether they truly belong, also known as belonging uncertainty (Walton and Cohen, 2007, 2011). Feeling uncertainty in one's belonging has been shown to lead to negative academic outcomes. For example, adolescents and college students who feel that they do not belong in their academic settings may express greater feelings of self-doubt, be less motivated, and perform worse in school (Walton and Cohen, 2007, 2011; Cook et al., 2012; Gillen-O'Neel and Fuligni, 2013). In a sample of graduate students from underrepresented racial and ethnic backgrounds, those who reported lower belonging at their university had greater anxiety, stress, and more depressive symptoms (Miller and Orsillo, 2020).

Conversely, previous research has also found that having higher social belonging and support from fellow graduate students predicted lower stress (Clark et al., 2008; Myers et al., 2012) and greater life satisfaction (Tompkins et al., 2016). This is in line with research on how feeling like one belongs to a group can increase perceived social support during times of difficulty, as close relationships can help protect individuals from stress (Cohen, 2004; Uchino, 2009). Graduate school and the COVID-19 pandemic are both periods in which there is heightened stress due to the uncertainty and lack of control experienced (Rettie and Daniels, 2020; Richmond et al., 2019). Thus, having social support from others in their graduate programs, which graduate programs could facilitate, may help protect students' current mental health, well-being, and optimism during difficult times.

Threat and Challenge

Threat and challenge are conceptualized as active motivational states and as opposing appraisals in stressful situations (Mendes et al., 2002, 2007). In other words, when in a state of challenge, people feel that they have the resources to be able to overcome the stressor, while those in a state of threat feel unable to do so (White, 2008). Within the academic context, challenge may be conceptualized as the motivation to persist or succeed while threat is the feeling of anxiety or worry about one's capacity to succeed (Folkman and Lazarus, 1985; Mak et al., 2004; Alter et al., 2010; Dennehy and Dasgupta, 2017). Similar to belonging, the impact of threat and challenge in academic settings have often focused on experiences of stigmatized group members. Members of a negatively stereotyped group may feel stereotype threat, or feel anxiety about possibly confirming the negative stereotype regarding their group, which can lead to decreased academic performance (Steele and Aronson, 1995 (for reviews see Schmader et al., 2008; Aronson and McGlone, 2009). However, when students from underrepresented racial and ethnic backgrounds are able to reappraise the threat as a challenge that they can conquer, their academic performance improves (Alter et al., 2010; Jamieson et al., 2010).

Threat and challenge appraisals in academics are also related to mental health and well-being, as greater challenge and lower threat have been associated with lower depressive symptoms (Mak et al., 2004). Outside of the academic context, lower threat and greater challenge have predicted decreased distress, greater psychological well-being, and better health outcomes (Florian et al., 1995; Blascovich, 2008). During the COVID-19 pandemic, psychology graduate students are currently encountering a variety of unprecedented stressors within their programs; classes and meetings going remote, in-person lab research being halted, and limited funding sources. These stressors may be pushing graduate students to learn how to restructure their work, which could further increase their stress and negatively impact their mental health.

GRADUATE STUDENT STRESS AND MENTAL HEALTH

In a recent report from *Nature*, an international sample of doctoral students across all fields revealed that the majority of graduate students struggle with work/life balance, job uncertainty, concerns with finishing their research in a timely manner, and financial worries (Lauchlan, 2019). Previous

research indicated that psychology graduate students also share these similar stressors. A survey conducted by the American Psychological Association (APA) found that 70% of psychology graduate students in the United States, had a major stressor that prevented them from functioning optimally (El-Ghoroury et al., 2012). A majority of graduate students in this sample reported academic pressure, financial trouble, anxiety, and poor work–life balance as key stressors (El-Ghoroury et al., 2012).

Due to these stressors, graduate students may experience declines in mental health. Graduate students who indicated that they struggled with work–life balance also reported more anxiety and depressive symptoms (Evans et al., 2018). Furthermore, graduate students experienced depression and anxiety six times more frequently than the general population, as approximately 40% of graduate students reported moderate to severe depression and anxiety, compared to 18% in the general world population [Anxiety & Depression Association of America (ADAA), 2021]. Rates among psychology graduate programs may be even worse in comparison to other areas of study, as students in the behavioral and social sciences reported greater depression rates in comparison to students in engineering (Allen et al., 2020). Furthermore, an APA survey found that 87% of psychology graduate students reported having anxiety, 68% experienced depressive symptoms, and 19% reported suicidal ideation, all three of which are higher than the national average (Willyard, 2012). However, although these effects have been recorded in previous studies, there is little evidence focusing on graduate student well-being during times of national crisis and times of high uncertainty, such as the current COVID-19 pandemic.

In the current study, we examined psychology graduate students' mental health and well-being during the current COVID-19 pandemic, a time marked by increased stress and uncertainty (Kluger, 2020; Myers et al., 2020). We sought to investigate how graduate students' psychological experiences and feelings regarding their program may relate to mental health and well-being, and the tendency to have a more optimistic outlook towards the future during the pandemic.

OPTIMISM: A SOURCE OF RESILIENCE DURING TIMES OF UNCERTAINTY

Optimism, defined as a measure of positive "generalized outcome expectancies" (Scheier and Carver, 1985) has been considered a hallmark of living a happy life. Studies have found consistent evidence highlighting the positive impact of optimism in different aspects of one's life. There is ample evidence that optimism is correlated with better health outcomes (e.g., Alarcon et al., 2013; for a review see Scheier and Carver, 2018) and well-being (e.g., Scheier and Carver, 1993). Individuals who tend to be optimistic also perceive negative circumstances as challenges as opposed to threats (Baumgartner et al., 2018), and also exhibit more constructive responses to physical stress (Segerstrom et al., 1998), emotional distress (Kelberer et al., 2018), and work-related stress (Gottschling et al., 2016).

Optimism has been regarded as an effective tool that can help individuals cope with uncertainty. For example, research has shown that when individuals are presented with uncertain events, optimists engage in positive thinking, which in turn helps them interpret the event as more beneficial or advantageous in line with their optimistic worldview (Grover et al., 2019). In times of difficulty, optimism has also been linked to positive outcomes in behavior and cognitive appraisal (e.g., Boldor et al., 2012). For example, optimism during a crisis (e.g., terrorist attack, natural disasters, cancer) is associated with greater resiliency, better mental health, lower stress, and greater engagement in problem-solving (Auerbach et al., 2005; Bleich et al., 2006; Peled et al., 2008; Carbone and Echols, 2017). Even more broadly, optimism has been linked to more adaptive coping (Fontaine et al., 1993; Iwanaga et al., 2004), and greater post-traumatic growth (Britton et al., 2019).

Since optimism is a source of resilience, it is crucial when individuals are faced with uncertainty. Therefore, it is important to understand what gives rise to optimism during difficult situations. In the context of our study, we sought to understand the antecedents of optimism in graduate students during the COVID-19 pandemic in order to identify how graduate programs can help support graduate students. Thus, our current study focuses on how program experiences relate to mental health outcomes and optimism. Since graduate students already struggle with work/life balance, financial worries, and job uncertainty (Lauchlan, 2019), which may be exacerbated during the COVID-19 pandemic, it is important to understand how graduate programs can effectively support high levels of optimism for graduate students, to help students remain resilient during the COVID-19 pandemic.

THE CURRENT STUDY

In line with recent calls for psychologists to consider the outcomes that the COVID-19 pandemic might have on students (Chenneville and Schwartz-Mette, 2020), the current study examined how graduate students' psychological experiences in their graduate programs (i.e., belonging, threat, and challenge) correlate with their mental health outcomes and well-being. Importantly, the current study examined how graduate experiences may help foster resilience (i.e., the degree to which they are optimistic about the future) during the onset of the pandemic, a period marked with high uncertainty. Consistent with previous literature (e.g., Mak et al., 2004; Miller and Orsillo, 2020), we hypothesized that positive psychological experiences within a graduate program, defined as higher levels of challenge (i.e., motivation to succeed), and belongingness, and lower levels of threat, would be associated with better mental health and well-being (i.e., greater life satisfaction and subjective happiness, and lower stress and depression). We also hypothesized that students' who reported better overall mental health and well-being would have greater optimism regarding the onset of the COVID-19 pandemic. Moreover, we tested how students' social identities of gender, race, and sexual orientation may impact their graduate program experiences, as students with marginalized identities have previously reported more negative experiences in higher education (e.g., Walton and Cohen, 2007;

Woodford et al., 2014; Dennehy and Dasgupta, 2017). Lastly, to further contextualize our findings we explored whether students' open-ended responses to a question focusing on the impact of COVID-19 on their lives, would be associated with their psychological experiences. Based on our findings, we discuss suggestions for how graduate programs can better support their graduate students during this pandemic and future times of crisis, by creating an environment focused on social belonging, positive challenge, and reduced threat which we hypothesize will be associated with greater optimism during the pandemic.

MATERIALS AND METHODS

Participants

Psychology graduate students pursuing doctoral degrees were recruited online (N = 1,798). Our recruitment process was initiated on February 14 and lasted until June 4. The sample included in this investigation comprises a sub-sample of students (N = 916) who were recruited during the onset of the COVID-19 pandemic from March 23 to April 5, after measures relevant to the pandemic were incorporated into the survey to address the effect of COVID-19 on graduate satisfaction and well-being. Thus, the subsample included here pertains to students who were recruited during the rise of COVID-19 as an ongoing crisis gaining widespread national attention across America.

Graduate students were either contacted directly via a personal email, or indirectly via an email sent to their program's department chair and/or administrator. They were also able to sign up for the study through a posting in student listservs in different psychological associations.[1] Our sample consisted of 916 psychology graduate students from 144 different Ph.D. granting institutions in the United States.[2] Students represented a variety of psychological fields: 321 (35%) were from Clinical, 127 (14%) from Social/Personality, 96 (11%) from Cognitive, 86 (9%) from Developmental, 67 (7%) from Neuroscience, 52 (6%) from Industrial-Organizational, 32 (4%) from Counseling, and 127 (14%) from other fields such as Health and Community Psychology. Students also varied in the number of years they were in graduate school: 155 (22%) were on their first year; 189 (26%) on their second; 13 (2%) on their third, 164 (23%) on their fourth, 131 (18%) on their fifth; and 64 (9%) were in graduate school for more than five years, and 199 preferred to not give a response.

From the 916 students, 772 (85%) were American and 137 (15%) were international. In terms of gender, 701 (77%) students identified as a woman, 193 (21%) as a man and 13 (1%) as transgender or non-binary. For race, 645 (72%) students were White, 107 were Asian or Asian American (12%), 59 (7%) were Latinx, 37 (4%) were African American, and 48 (5%) were multiracial. In terms of sexual orientation, 650 (73%) students were straight, 188 (21%) reported being bisexual/queer, 45 (5%) were gay/lesbian, and 5 (<1%) reported being either asexual or

some other sexual orientation. The average age was 27.73 years (SD = 4.16). Students reported low levels of religiosity (M = 2.88, SD = 2.37; min = 1, max = 9), were politically liberal (M = 2.46, SD = 1.40; min = 1, max = 9) and reported a low annual personal income (M = 3.15, SD = 0.81; min = 1, max = 9; equivalent to a range of \$10,000–\$30,000).[3]

Materials and Procedure

After providing consent, the students were first presented with a set of demographic questions. Following the completion of the demographic section, participants were presented with the different measures of the study in a randomized order.

Psychological Experiences in Graduate School

Students' psychological experiences in graduate school were operationalized and measured as feelings of social belongingness, and perceptions of their graduate program as threatening or challenging. All of the measures included in the study were captured on 1–9 analog slider scales.

Social Belonging

Feelings of social belongingness were measured with four items (adapted from Dennehy and Dasgupta, 2017) assessing how much students felt included, accepted, invisible (reverse-coded) or like an outsider within their program (reverse coded), (a = 0.90, M = 6.30, SD = 1.98).

Threat and Challenge

We assessed threat and challenge with a total of eight items (four for each construct, adapted from Dennehy and Dasgupta, 2017). Threat captured the degree to which graduate students felt stressed, worried, unsure about their program, or felt that their program was difficult (a = 0.73, M = 6.22, SD = 1.49). Challenge captured the degree to which students felt they had the skills and motivations to succeed in graduate school (i.e., "I will be able to overcome any challenges I experience"; a = 0.89, M = 6.28, SD = 1.53).

Student Mental Health and Well-Being
Mental Health

Mental health was captured by assessing students' depression and stress levels. Depression (a = 0.89, M = 4.82, SD = 1.47) was captured with the 10-item version of the Center for Epidemiologic Studies Depression Scale (CES-D Scale; Zhang et al., 2012). Stress (a = 0.88, M = 5.22, SD = 1.37) was captured with the 10-item Perceived Stress Scale (Cohen and Williamson, 1988).

Well-Being

Individual differences in well-being were assessed by measuring students' satisfaction with life and subjective happiness. How satisfied students felt with their life (a = 0.89, M = 5.69, SD = 1.66) was measured with the 5-item Satisfaction with Life Scale (Diener

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[1]For list of all the associations which were contacted with the purpose of posting our study's link on their listserv, see the online **Supplementary Material.**

[2]For a list of all the institutions for which at least one student responded to the survey see the online **Supplementary Material.**

[3]The total number of students does not add up to 916 on specific items or demographic information, as some students left certain questions unanswered.

et al., 1985). Students' level of happiness (a = 0.91, M = 5.66, SD = 1.76) was assessed with the 4-item Subjective Happiness Scale (Lyubomirsky and Lepper, 1999).

Optimism During COVID-19

Our main outcome focused on students' optimism for the future. This item was phrased as follows: "*When thinking about the impact of COVID-19 on your life, how optimistic do you feel about the near future?*" Responses ranged from "*1 = Not at all optimistic*" to "*9 = Very optimistic.*" We chose to frame our item to reflect optimism during the COVID-19 pandemic as past research has shown that domain specific measures of optimism are better suited in academic settings in comparison to dispositional optimism measures (Chang et al., 2011). We also chose to utilize a one-item measure of optimism. This choice was made because students were surveyed during the COVID-19 pandemic, a very stressful time, and thus, we wished to keep our survey short to be considerate of students' time in our recruitment process. Past studies have utilized single-item measures of optimism and have found single item measures to be reliable (Wong and Fielding, 2006; Bentsen et al., 2008; Lau and Knardahl, 2008).

COVID-19 Open-Ended Question

An additional question, which was open-ended in nature, asked the students how the COVID-19 pandemic had impacted their life.

Data Analysis Plan

Data management and quantitative analyses were performed in SAS (Statistical Analysis Software) version 9.4. To examine the relationship between students' psychological experiences in graduate school with their mental health, well-being and optimism for the future, bivariate correlations and path models were computed.

Initial qualitative data analyses were conducted using LIWC (Linguistic Inquiry and Word Count program, see Pennebaker et al., 2015). LIWC calculates the percentage of certain word categories contained within a given response, comparing each word within a text to a specified LIWC dictionary file. For our research, we analyzed participant's written responses using LIWC's "positive emotion" and "negative emotion" dictionaries, which contain 12,878 and 15,115 individual word entries, respectively (Balage Filho et al., 2013).[4] In particular, we focused on examining the relationship between the emotional valence (LIWC's calculated percentage of positive and negative words present) of the response with student's psychological experiences in graduate school (i.e., social belonging, threat, and challenge). In addition, we also examined how support from graduate programs during the COVID-19 pandemic were associated with psychological experiences. To address this more specific question, we utilized qualitative content analysis to thematically hand-code

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[4]Research has demonstrated that the LIWC calculations of positive and negative emotion words correspond well to human ratings of the writing excerpts (Alpers et al., 2005) and that overall, LIWC provides accurate identification of emotion in language use (Tausczik and Pennebaker, 2010).

students' open-ended responses (Schreier, 2014). After reading all participant responses, the third author developed a coding scheme indicating the presence (1) or absence (0) of COVID-19 impacts in multiple domains of participant's lives (e.g., graduate work, family, mental health, physical health). This coding scheme was corroborated by two independent research assistants who developed their own coding schemes for comparison; the final coding scheme reflects the iterative discussion and agreement of coding categories by the research team (see **Supplementary Material** for full coding categories and results).

RESULTS

Correlations

Positive psychological experiences in graduate school, defined as increased social belonging, increased challenge (motivation to succeed) and decreased threat (anxiety and nervousness related to one's standing in the program) were correlated with increased well-being (life satisfaction and happiness) and better mental health (lower scores in depression and stress). Positive psychological experiences were also correlated positively with optimism during the COVID-19 pandemic. Life satisfaction and happiness were positively associated with optimism about the future during the COVID-19 pandemic while depression and stress were negatively associated. All of these relationships remained significant after controlling for political beliefs, income, and religiosity of students. These coefficients are displayed in **Table 1**.

Path Model

To examine these relationships simultaneously, we computed a path model. As our exogenous or independent variables, we included the three aspects of psychological experiences in graduate school: social belonging, challenge and threat. As our intermediate variables, we included the different aspects of well-being and mental health: depression, stress, satisfaction with life, and subjective happiness. Our outcome was optimism about the future.

The model's fit to the data was excellent: χ^2 (3) = 2.71, p = 0.438. The fit indexes also suggested a good fit: CFI = 1.00, NFI = 1.00, RMSEA < 0.001, SRMR = 0.007. All the paths were significant and in the expected direction, with the exception of the effect of depression on optimism for the future, which was no longer significant after covarying it with the other indicators of well-being and mental health. The path coefficients and the model itself are presented in **Figure 1**.

We also tested whether being from an underrepresented background was related to greater negative psychological experiences in graduate school, in accordance with past research findings that suggest BIPOC students feel lower social belonging, challenge, and increased threat (e.g., Steele and Aronson, 1995; Dennehy and Dasgupta, 2017). Thus, we included students' reports of their racial, sexual and gender identities in our model as predictors of students' psychological experiences in graduate school. We coded students' race as "White = 1" and "BIPOC students = 0." Though experiences vary greatly across racial and

	1	2	3	4	5	6	7	8
1. Social belonging	–	0.34	−0.25	−0.41	−0.29	0.38	0.32	0.11
2. Challenge	0.33	–	−0.51	−0.53	−0.51	0.46	0.40	0.23
3. Threat	−0.24	−0.51	–	0.60	0.60	−0.39	−0.37	−0.22
4. Depression	−0.40	−0.53	0.60	–	0.72	−0.61	−0.60	−0.30
5. Stress	−0.28	−0.51	0.60	0.72	–	−0.51	−0.52	−0.38
6. Satisfaction with life	0.37	0.45	−0.39	−0.61	−0.52	–	0.58	0.30
7. Subjective happiness	0.32	0.40	−0.37	−0.60	−0.53	0.58	–	0.31
8. Future Optimism	0.11	0.23	−0.23	−0.31	−0.39	0.30	0.32	–

Raw bivariate correlations are depicted below the diagonal, while partial correlations controlling for political beliefs, religiosity and income are displayed above the diagonal. All coefficients are significant at $p \leq .001$.
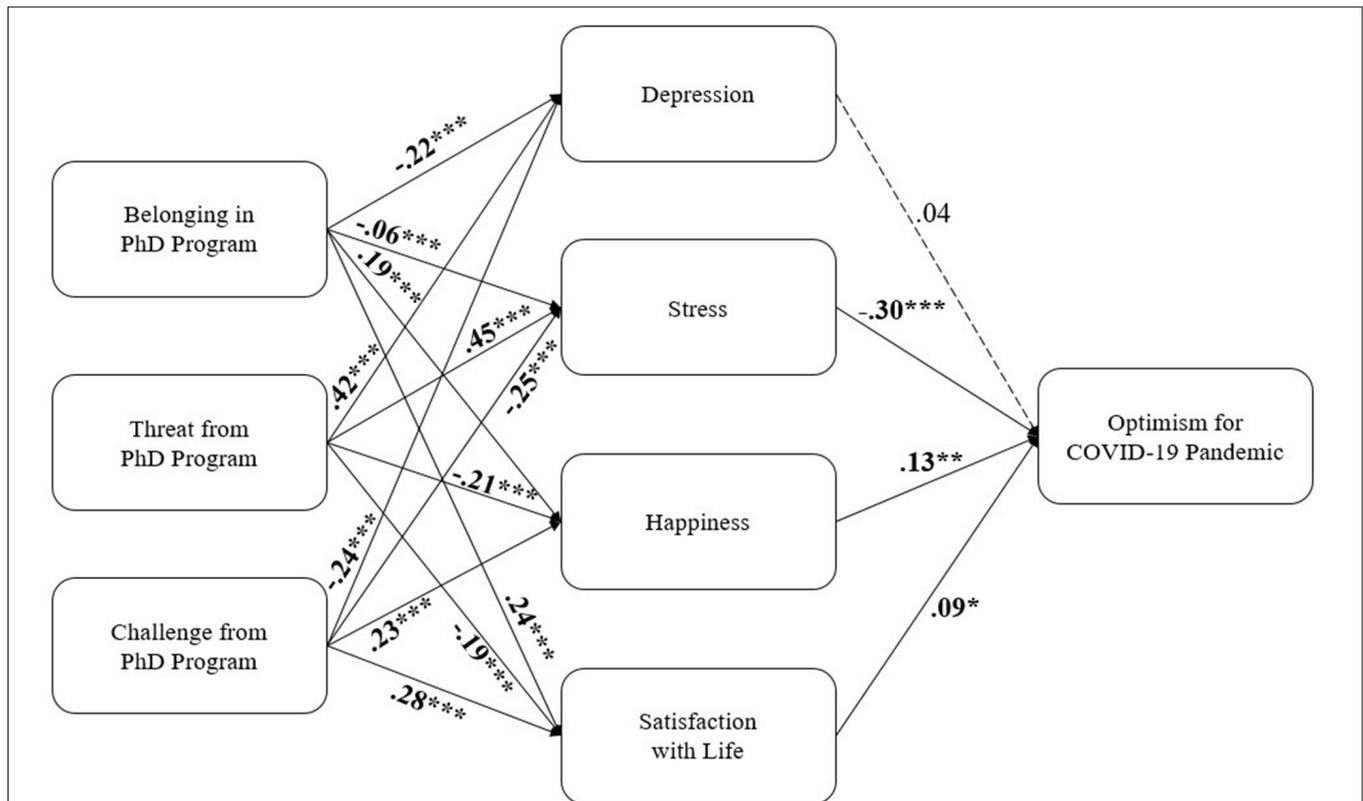
FIGURE 1 | Path model for psychological experiences in graduate school predicting optimism during COVID-19 through student well-being and mental health. Standardized weights are displayed. Dashed arrows portray non-significant paths; *$p \leq .050$; **$p \leq .010$; ***$p \leq .001$.

ethnic groups, given our small numbers in each racial/ethnic group, we decided to combine all BIPOC students into one group. We included sexual orientation as another variable, coded as heterosexual = 1 and LGBQA = 0. Similar to our dummy-coded race variable, we had a small number of participants who fell into each sexual minority group; thus, we combined these individuals across groups. Lastly, we coded students' identifying gender as 1 = cisgender man and 0 = cisgender woman and transgender and nonbinary students. While transgender and nonbinary students' experiences may vastly differ from women's experiences, due to our small number of transgender and nonbinary students (N = 13), we elected to include them with cisgender women

rather than removing them from the present analyses given the underrepresentation of this group in psychology.[5] We also controlled for students' income, religiosity, and political beliefs by future optimism on these variables.

This model also exhibited very good fit to the data, albeit worse than **Figure 1**: χ^2 (39) = 98.90, $p < 0.001$; CFI = 0.98, NFI = 0.97, RMSEA = 0.04, SRMR = 0.03. All the paths from **Figure 1** remained significant. From the demographic variables, sexual orientation was associated with greater threat

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[5]Results are identical with and without the 13 students who identified as transgender or nonbinary.

TABLE 2 | Correlation coefficients with LIWC variables.

	Positive emotions	Negative emotions
Social belonging	0.03	**–0.08***
Challenge	0.03	**–0.11*****
Threat	**–0.07***	**0.09****
Depression	–0.03	**0.09***
Stress	–0.04	**0.09****
Satisfaction with life	0.05	–0.05
Subjective happiness	0.00	**–0.09****
Future optimism	**0.09***	**–0.12*****

*Values are significant at *p ≤ .050; **p ≤ .010; ***p ≤ .001. Bolded values highlight significant associations.*

TABLE 3 | Correlation coefficients with qualitative content codes of increased program pressure and increased program support during COVID-19.

	Increased program pressure due to COVID-19	Increased program support due to due to COVID-19
Social belonging	–0.05	**0.11***
Challenge	**–0.11***	**0.13****
Threat	**0.11****	–0.05
Depression	0.07	–0.08
Stress	**0.12****	**–0.11***
Satisfaction with life	–0.03	**0.13****
Subjective happiness	**–0.11***	0.08
Future optimism	–0.04	**0.10***

*Values are significant at *p ≤ .050; **p ≤ .010. Bolded values highlight significant associations.*

($\beta = -0.07$, SE = 0.03, $p < 0.05$), such that those who identified as heterosexual reported less threat than LGBQA students. Race was correlated with social belonging ($\beta = 0.13$, SE = 0.03, $p < 0.001$), such that White students reported greater belonging than students of color. Gender was associated with both threat ($\beta = -0.15$, SE = 0.03, $p < 0.001$) and challenge ($\beta = 0.08$, SE = 0.03, $p < 0.05$), such that women, transgender, and nonbinary students expressed greater threat and lower challenge in their graduate programs. All the path coefficients for this model are displayed in **Figure 2**.

Qualitative Evidence

As expected, LIWC analysis indicated that greater social belonging and challenge were each correlated with a lower percentage of negative emotion words within a participant's open-ended response to the impact of COVID-19 on their lives. In contrast, greater threat was correlated with a higher percentage of negative emotion words in addition to a lower percentage of positive emotion words. Furthermore, depression and stress were positively correlated with the percentage of negative emotion words, while happiness was negatively correlated with the percentage of negative emotion words. Greater optimism was correlated with a lower percentage of negative emotion words; it was also correlated with a higher percentage of positive emotion words (see **Table 2**).

In addition, qualitative content coding indicated that students who specifically described increased pressure and work from their programs due to COVID-19 reported lower levels of challenge and happiness as well as higher levels of threat and stress. In contrast, students who described increased program support from their programs because of COVID-19 reported lower levels of stress and greater feelings of belonging, challenge, life satisfaction, and, most importantly, optimism (see **Table 3**). Examples of a supportive and an unsupportive response from one's graduate program are presented below:

Supportive program response:

I value face-to-face interaction which is no longer happening, and executing my teaching assistant duties now looks very different than it did a few weeks ago. But, overall, people have been supportive and communicative, and my program has ultimately kept me sane throughout this ordeal. – Student 185

Unsupportive program response:

The constant pressure to produce work and ignore our mental well-being is more pervasive now than ever before. Graduate programs, as a whole, seem to be acting as though the COVID-19 pandemic is simply a required sabbatical. This is wrong and inappropriate– the COVID-19 pandemic is a pandemic. People are dying, including those we know and love. It is inappropriate, and outright negligent, to pressure students to not only proceed as though nothing has changed, but also produce their best work yet. This pressure, along with the other mental and physical tolls the pandemic has taken, are making it incredibly difficult to persevere as a student. – Student 762

DISCUSSION

Graduate students experience high amounts of stress and poor mental health outcomes (Evans et al., 2018), which may be exacerbated due to the current COVID-19 pandemic (Zahneis, 2020). In a sample of 916 psychology graduate students from 144 American universities, we found that positive psychological experiences (higher belonging and challenge, and lower threat) regarding one's graduate program were associated with better mental health outcomes (lower depression and stress), greater well-being (life satisfaction and happiness), and greater optimism about the future during the COVID-19 pandemic. Students of color, LGBTQ+ students, and women reported worse psychological experiences in their graduate programs.[6] Furthermore, correlations between our quantitative and qualitative responses indicated a small but significant association between a student's stress levels in graduate school during the pandemic and student's psychological experiences and mental health outcomes. A small but significant correlation was also observed between reported increased support due to COVID-19 and more positive psychological experiences, better mental health outcomes, and greater optimism.

Our findings suggest that graduate programs could play a significant role in graduate students' optimism during the COVID-19 pandemic. When students felt more support during

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[6]These analyses can be found in the online **Supplementary Material.**

FIGURE 2 | Path model showing the effect of students' identities on their psychological experiences in graduate school predicting optimism during COVID-19 through student well-being and mental health. Cis, Cisgender; BIPOC, Black, Indigenous, and People of Color; LGBQA, Lesbian, Gay, Bisexual, Queer, and Asexual; TNB, transgender and nonbinary. Political beliefs, religiosity and income are also included as predictors of future optimism, to account for their effect on our outcome; Standardized weights are displayed; Dashed arrows portray non-significant paths; values are significant at *$p \leq .050$; **$p \leq .010$; ***$p \leq .001$.

the pandemic, this was associated with greater optimism. Furthermore, programs could proactively create environments that would bolster students' optimism during periods of uncertainty. For example, when students felt less threatened by their obligations and felt that they belonged in their programs, they felt more optimistic about the pandemic. Given that we know that optimism is malleable (Peters et al., 2010), and that interventions aiming to increase optimism are often effective (Malouff and Schutte, 2016), graduate programs could strive to ensure their students maintain high levels of optimism, potentially increasing resilience during the ongoing pandemic.

Furthermore, in our sample, and that of previous studies (e.g., Steele and Aronson, 1995; Walton and Cohen, 2011; Dennehy and Dasgupta, 2017), students from underrepresented backgrounds experienced more negative psychological experiences (lower belonging, higher threat, and lower challenge), which in turn, exacerbated the negative impact of the pandemic for these students. The COVID-19 pandemic has disproportionately affected BIPOC communities in the United States, as Black, Latinx, Asian, and Native American people have a morbidity and mortality rate that is higher than White individuals' (Center for Disease Control and Prevention, 2020; Oppel et al., 2020). Media and scholars have also acknowledged the current double pandemic, as racial discrimination has increased against Asians (Addo, 2020; Croucher et al., 2020) and Black Americans continue to face racial injustice at the hands of law enforcement (Kendi, 2020). To address these inequities, graduate programs should recognize that students of traditionally stereotyped or underrepresented backgrounds face additional challenges in graduate school which may be exacerbated by the pandemic and programs

should work to rectify these disparities (e.g., increase diversity in their programs, provide more resources and funding for BIPOC students).

LIMITATIONS

We also note a few limitations in our study. First and foremost, our results rely exclusively on correlational evidence from a single timepoint during the emergence of the COVID-19 pandemic in the United States. Although informative, these findings cannot shed light on how graduate school psychological experiences, mental health and optimism have fluctuated during the course of the pandemic. Second, our sample did not have a large enough number of transgender and nonbinary students ($n = 13$) to analyze as a separate gender group; thus, in order to include these students in our analysis, we opted to combine their responses with cisgender females, another gender group that has been historically marginalized in the academy. However, we do note that the academic experiences of transgender and nonbinary students greatly differ from cisgender females (Goldberg et al., 2019) and future research should aim to recruit larger samples to accurately capture each group's unique lived experiences. Finally, although our qualitative analyses provide further insights into graduate student experiences during the pandemic, our open-ended questions were rather limited in their content. Although our qualitative results are useful in validating the conceptual nature of our measurements and provide initial insights into the relationship between graduate program support in times of crisis and student well-being, these findings are limited both by the small observed effect sizes and our study's correlational

nature. Neither the LIWC analysis or hand-coding provide clarity into the direction of the relationship. In addition, while LIWC is a reputable program commonly used for text analysis, it is not possible to see what exact dictionary words are being considered in its calculated text analysis, and similarly, hand-coding qualitative data is a subjective process that may have some variation based on the coder(s). To address these concerns, future research could build on the current coding scheme by explicitly asking participants if and how COVID-19 impacted their graduate school experience, ideally examining perceptions of participants about each domain at time points both before and after COVID-19's onset.

FUTURE DIRECTIONS AND RECOMMENDATIONS

Despite these limitations, we outline a few suggestions based on our results for graduate programs. First, to increase or maintain social belonging during the COVID-19 pandemic and other times of crisis in general, programs could create virtual spaces for social support and connection. For example, programs could utilize these spaces to check-in on students, to inquire about their well-being, and to provide encouragement. Faculty advisors could also check-in regularly with their graduate mentees to provide support as the pandemic progresses, as students who expressed feeling greater support from advisors felt greater belonging in their programs (Curtin et al., 2013). Second, to decrease feelings of threat and to increase feelings of challenge, programs should recognize that the current situation is unprecedented and involves heightened levels of uncontrollable stress that are not easy to overcome. Graduate students should not be expected to be more productive or to spend more time working (i.e., before the pandemic, 76% of graduate students already reported working 41 or more hours a week; Lauchlan, 2019). Since graduate students experience anxiety and depression at much higher rates than the general population (Evans et al., 2018), greater expectations in work may have detrimental impacts during the current pandemic. We recommend instead that graduate students should be allowed more flexible timelines (i.e., similar to increasing tenure clocks for faculty; Pettit, 2020) as the impact of the pandemic on student lives is prolonged.

Third, it should be recognized that each graduate student will have different circumstances as a function of their social identity (e.g., race, gender, and sexual identity) and due to individual life events. Students from underrepresented backgrounds face greater societal challenges, which can carry over into academia. The pandemic has also disproportionally affected BIPOC communities (Croucher et al., 2020; Oppel et al., 2020). Furthermore, the pandemic has negatively impacted

working mothers, who are generally the primary caretakers, as they are expected to both provide childcare and continue to work (Robinson, 2020). To address these issues, graduate programs should strive to be inclusive of all of their students and do so in a way that is procedurally fair and equitable. Each student will face unique stressors, and consequently, programs and advisors should allow each student to have flexibility in their duties while also striving to maintain confidence in their students' abilities.

In conclusion, we believe that graduate programs can help bolster graduate student mental health, well-being, and optimism during the COVID-19 pandemic through increasing social belonging and encouragement, as well as decreasing anxiety by adjusting graduate student expectations. These suggestions may be even more important for women, BIPOC, and LGBTQ+ students, as they face increased societal stressors that may also impact their experiences and productivity in graduate school.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Massachusetts Amherst Human Research Protection Office. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

SS: project administration, data curation, investigation, conceptualization, formal analysis, methodology, visualization, software, validation, writing—original draft, and writing—review and editing. DW: project administration, data curation, investigation, methodology, conceptualization, validation, writing—original draft, and writing—review and editing. BB: visualization, formal analysis, methodology, writing—original draft, and writing—review and editing. EM: methodology, supervision, and writing—review and editing. All authors contributed to the article and approved the submitted version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.629205/full#supplementary-material

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What Really Matters: Experiences of Emergency Remote Teaching in University Teaching and Learning During the COVID-19 Pandemic

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The COVID-19 pandemic and related lock downs have accelerated the need for online and remote teaching within university settings. However, due to the abrupt nature of the pandemic, many academic staff were not prepared for this forced transition. This study aimed to understand how the pandemic affected academics at a New Zealand university, with regards to their transition to emergency remote teaching. Specifically, it explores the challenges as well as benefits academics experienced during this transition. Recommendations for future online learning are also made. Academic staff ($N = 67$) at a New Zealand University completed an anonymous online survey. Quantitative data were analyzed statistically using descriptive and inferential statistics, while qualitative data were analyzed thematically. Major challenges experienced included miscommunication from the university, concerns about student access to technology, finding a quiet space to work, lack of digital competence skills, too much screen-time, managing work hours, and work/life balance. Benefits included enhanced flexibility, enhanced teacher creativity, increasing autonomy of learners, and reduced commute time. Looking forward, academic staff desired future teaching to include blended learning and virtual immersion. New strategies of working remotely are being explored to facilitate teaching and learning while catering to the preferences and skills of both educators and students. Our findings honor the considerable agility of academic staff who sought to sustain and enhance excellence in remote education. At an institutional level our findings point to the need for staff to be supported by their institutions as they further refine their work within new-found spaces.

Keywords: COVID-19, higher education, teaching and learning, blended learning (BL), pandemic, learning organizations, emergency remote education

1 INTRODUCTION

1.1 Online and Remote Learning

The history of teaching and learning in higher education settings has predominantly been face-to-face. However, other modes involving distance learning have developed in parallel, including education by postal correspondence and radio and television courses (e.g. United Kingdom's Open University). More recently, lives and education have further shifted as our world has

become more digital (Bearman et al., 2020). For many, turning to Google or YouTube to search for information or learn a skill is common practice (Bhatt and MacKenzie, 2019). Unsurprisingly, formal learning is also increasingly positioned online. Selwyn (Selwyn, 2016, p. 6) notes, "The confluence of technology and education is complicated, contradictory and messy." This is reflected in current times, whereby the pandemic has accelerated, and for some forced, the transition to fully remote teaching and learning. Online and remote forms of education have occurred in Australia and New Zealand since around 1922 (White, 1982; Bewley, 1996; Seelig et al., 2019). In the University where this study takes place, online and remote teaching prior to 2020 was a generally limited to specific undergraduate courses, however very few were offered fully online.

1.2 Pivoting to Emergency Remote Teaching and Learning During the COVID-19 Pandemic

The COVID-19 pandemic hastened applications of digital teaching and learning (Houlden and Veletsianos, 2020). As a result, many educators did not have the necessary digital literacy skills. Furthermore, a clear vision for what was required may have been lacking (Dhawan, 2020). A digital pedagogical pivot (Anderson, 2020) as an emergency remote teaching option needed to occur quickly and efficiently.

In New Zealand, the government imposed a level four national lockdown to limit and control community transmission of COVID-19 on March 26, 2020 (New Zealand Government, 2020). The entire population was required to stay at home and shelter "in their bubble" (except for essential workers or those experiencing an emergency). Travel was severely restricted with all gatherings cancelled and public venues closed (New Zealand Ministry of Health, 2020). While some remote learning has been occurring over many years (Ralston, 2020), the pandemic accelerated this process and expanded its scope causing what has been identified in the international literature as "emergency remote teaching" (Hodges et al., 2020). The terms "emergency remote teaching" and "online teaching and learning" have both been used in the context of the pandemic event and need to be appropriately defined for the purposes of this research.

Emergency remote teaching (ERT) is a temporary shift of instructional delivery to an alternate mode due to crisis circumstances (Hodges et al., 2020). It involves the use of fully remote teaching solutions for instruction and education that would otherwise be delivered face-to-face or as blended courses. While this research focused on ERT, the term "online teaching and learning" was used extensively throughout the survey. This is because the term ERT is not commonly used in New Zealand and so would be unfamiliar to participants. In contrast, online learning is both a social and a cognitive process (Conole, 2021), not merely a matter of information transmission via remote information technologies. Careful planning for online learning therefore includes not only identifying the content to cover but also consideration of how different types of interactions will be supported and prioritized. Consequently, development of online courses may take up to 9 months.

Key components of successful online and remote educators are identified as including passion for the work, confidence to move forward, and the skills to successfully make the transition (Wieland and Kollias, 2020). All three of these key influences are likely to have been negatively impacted by the pandemic. Passion may have been muted by the abruptness of a forced transition while concurrently navigating stressors associated within family life (e.g. working from home whilst also home-schooling). Confidence with teaching is likely to be diminished, when the medium requires digital expertise in new technologies and communication skills (König et al., 2020; Marshall et al., 2020; Pather et al., 2020).

Additionally, deep-rooted issues experienced by academic staff were accentuated during the pandemic, including concerns of equity, disinvestment, and shifting teaching and learning platforms (Sălceanu, 2020). At an organizational level challenges included the lack of consideration for sustainability relating to abrupt closure of all campuses, a lack of practiced communication pathways for disseminating information rapidly, and staff inexperienced in finding resources and personnel while working remotely.

1.3 Teaching and Learning Remotely in an Emergency

There is evidence that ERT has equivalence with on-campus environments with respect to key outcomes such as student success (McPhee and Söderström, 2012) and student satisfaction measures (Palmer, 2012). There is also evidence that ERT benefits educators (Roddy et al., 2017) with expansion of networks providing a related increase in opportunities to work collegially. The impact of COVID-19 and the subsequent effect on the operations of the university raises questions around institutional priorities and strategies to achieve these positive teaching and learning experiences in constrained circumstances.

Remote teaching occurred prior to the pandemic with most academics having some level of familiarity with email, accessing information through digital library systems, and some knowledge of learning management systems. However, working exclusively at a distance from students, colleagues, and institutional support systems may have generated additional challenges. The University where this research was conducted provided some support to ensure smooth running of digital platforms which was accessible by academics. There were also links on the university website to the Ministry of Education which may have been of assistance. However, the extent to which these resources were utilized remains unclear.

While learning is frequently posited as something students do, learning how to teach remotely became a major focus for academic staff. This global phenomenon impacted educators worldwide. However, it also provided collaboration which might not have otherwise occurred. For example, the European Institute for Innovation and Technology provided accessible resources for online teaching in higher education (EIT InnoEnergy, 2020). E-collaborations became frequent (Favale et al., 2020). This was important as most higher

education institutions were forced to pursue some form of remote education during the pandemic (Houlden and Veletsianos, 2020). Some universities became part of an international and collegial network with the aim of keeping institutions both economically and educationally viable (Nicola et al., 2020).

Tertiary institutions and researchers are now increasingly learning from the experience of academics, as subsequent waves of COVID-19 are resulting in repeated lockdowns and closures. As of November 2020, 32.7% of total enrolled learners are studying remotely, which accounts for 30 country-wide closures (UNESCO Institute for Statistics data, 2020). Specifically, universities are exploring educator experiences to determine what can be done to improve current teaching (Whittle et al., 2020; König et al., 2020). This additional digital expertise, on top of what was already being required, has contributed to exhaustion and in some cases burn-out of academic staff (Eagle Hill Consulting, 2020; Pather et al., 2020). For many, the creativity and energy required to transition to remote teaching was overwhelmed by the need to "survive" and secure essential food and supplies for the pandemic lockdown (Almost, 2020).

Recently published research from Germany, Australasia, India and the United States has explored educator experiences of emergency remote teaching during the COVID-19 pandemic (Cameron-Standerford et al., 2020; Gamage et al., 2020; Irtifa and Richa, 2020; König et al., 2020; Marshall et al., 2020; Pather et al., 2020). However, to date, there is limited research on the experiences of academics during the pandemic, including support mechanisms and unintended benefits. Additionally, as identified by Sokal et al. (2020), there remains a need for research that explores the influence of internal and external factors on stress experienced by academic staff during the COVID-19 pandemic. While there is considerable interest in the experience of remote teaching globally, knowing how this was experienced locally (i.e. within New Zealand), along with strategies in how to better manage working with students and colleagues requires further exploration.

The aim of this study is to understand how the COVID-19 pandemic (with its subsequent lockdowns and isolation bubbles) affected academics in a health faculty at a university in Auckland, New Zealand with regards to their transition to platforms for emergency remote teaching. Specifically, it explores the personal, social, institutional and student-related challenges experienced during the transition as well as identifying the emerging benefits during the accelerated transition. Recommendations for future online and remote teaching and learning were also made by asking academics to pause and reflect on the effects to their personal and professional lives. Consideration is given to strategies perceived as effective, to better prepare for the future—a movement into a new Frontier.

2 MATERIALS AND METHODS

2.1 Setting and Sample
This cross-sectional survey study was approved by the university Ethics Committee (Reference 20/266) and was conducted during the COVID-19 pandemic from September to October 2020.

During this time New Zealand had eased out of a national lockdown, but uncertainty remained as regions moved up and down different alert levels. For example, Auckland moved into a regional lockdown due to uncontrolled community transmission from 12 August until the 30th August 2020. This meant that teaching continued remotely in an emergency mode. Academic institutions in Auckland reopened for the second time on October 7, 2020. The survey covered reflections on the initial experience of ERT during the first lockdown in March, as well as during the second lockdown when the survey was distributed, and into the future.

Participants were recruited from a New Zealand university. This included respondents from four schools within a Science and Health Faculty. A total of 497 academic staff employed across the Faculty and were invited to participate in the study.

Faculty participating in this research encompassed the following subject areas: Clinical health sciences, psychological studies, exercise science, nutrition, environmental health, medical laboratory science, food science, and public health. The courses in clinical health science, exercise science, food science, psychology, and environmental health involve primarily practical components including clinical and "industry" placements. The courses in medical laboratory science, nutrition, and public health involve primarily theoretical and laboratory components.

Before the pandemic the primary pedagogical approach was face-to-face teaching and courses were often taught in a classroom-based setting with associated labs and tutorials. Students then proceeded to relevant clinical placements as required by professional qualifications. There was some expertise in online pedagogical approaches with some remote teaching in large undergraduate courses, but this expertise was not widespread. When the lockdown occurred, many face-to-face laboratories and clinical placements ceased while virtual labs and simulations were added or expanded in some courses. There was also need for additional student engagement and support through group and one-on-one sessions via virtual office hours.

2.2 Procedures and Measures
2.2.1 Recruitment
The inclusion criteria were academic staff working in the Faculty during the COVID-19 lockdowns. Staff had to be living in New Zealand and involved in teaching and learning during the level four lockdown. Due to the potential limitation on recruitment caused by the survey being distributed while many staff were still working remotely, no upper limit for respondents was set.

Participants were recruited through the Faulty Teaching and Learning Network, campus posters with QR codes linking to a research survey, and word of mouth. Data collection occurred between lockdowns when access to the campus was modestly restored. The survey link provided both participant information and access to the online survey, which was hosted on Qualtrics.

Consent was obtained from respondents by requiring a circle be ticked at the beginning of the survey. No identifying information was collected, to preserve anonymity.

Additionally, the raw data on Qualtrics was password-protected with only the research team having access.

2.2.2 Survey Development

The survey was developed after reviewing other surveys with similar aims in Australia, New Zealand (Flack et al., 2020; Pather et al., 2020), and around the world (Aristovnik et al., 2020; Cameron-Standerford et al., 2020; Kawaguchi-Suzuki et al., 2020; Mahdy, 2020; Rapanta et al., 2020). Initially, a framework of key domains of interest within the research focus were developed. Existing survey questions were then identified to fit within the domains. Where there were gaps, existing questions were adapted, or new questions were developed. The survey instrument was peer-reviewed by an external researcher with expertise in educational research, and trialed by several staff within the Faculty, before the survey was implemented. The central focus of this research was, "What factors influenced your remote teaching and learning practice during the COVID-19 lockdowns?" The questions were modified to match the aims of this research.

Overall categories of impact were developed in order to give a clearer structure and intent to the survey. The categories included six sections. In the first five sections, respondents were asked to rate items in order of importance and respond to Likert-scale questions. Section one addressed demographics (e.g. age, ethnicity, school affiliated with, years of tertiary teaching experience. Section two addressed communication issues as the lockdown unfolded (e.g. most challenging and most beneficial communications from university during lockdown). Section three addressed resources related to Information Technology (IT) available to educators as well as the speed and type of Internet access. Section four addressed issues emerging when working from home and online (e.g. available quiet space, access to technology, digital competence). Section five focused on academic experiences while teaching remotely. Finally, section six focused on how the university might look in the future. This section contained five questions which allowed for open-text responses. The survey took between 10 and 15 min to complete.

2.3 Data Analysis

2.3.1 Quantitative Analysis

The quantitative analysis was primarily descriptive, producing frequencies, percentages and mean scores or ranks to present the survey data. SAS version 9.4 (www.sas.com) was used for data management and statistical analysis.

An analysis of all survey questions demonstrated no significant correlation for the order in which options for each question were presented and the preferences of respondents (Spearman's rank correlation $p = 0.74$), which indicates that there is no significant bias introduced by the order in which options appear.

2.3.2 Qualitative Analysis

Qualitative analysis involved responses to the open-ended questions being analyzed thematically in accordance with the Braun and Clarke (2006) framework. An inductive process was

TABLE 1 | Participant demographics ($n = 67$).

	No	%
Age (years)		
20–30	4	6.3
31–40	13	20.3
41–50	23	35.9
51–60	13	20.3
Over 60	11	17.2
Not specified	3	—
Ethnicity		
Māori	3	4.5
Pacific	2	3.0
Asian	8	11.9
Pakeha/New Zealand European	34	50.8
Other European	14	20.9
Other	8	11.9
School		
Public Health and Interdisciplinary Studies	34	50.8
Clinical Sciences	24	35.8
Sport and Recreation	1	1.5
Science	8	11.9
Tertiary teaching experience (years)		
<2	7	10.6
2–5	10	15.2
6–10	13	19.7
11–20	21	31.8
20 ≤	15	22.7
Not reported	1	—
Experience with online teaching		
Extensive experience	15	23.4
Some previous experience	32	50.0
This is my first experience	17	26.6

utilized, whereby the content of the data directed the coding and theme development process. Two researchers initially familiarized themselves with the data by reading through it. They then independently coded the data by assigning codes and provisional themes to establish further credibility in the analysis and representation of the data (Thomas and Harden, 2008). A second reading focused on the development of preliminary codes and identification of patterns within the responses (initial themes). Saturation was evident when no additional data were found to further develop the properties of each theme. These were then considered by further two other members of the research team, resulting in further refinement of the themes, ensuring that the themes identified were relevant to the research question and added depth to the quantitative results. Discussions then occurred with all members of the team in gaining further consensus, contributing to the credibility and trustworthiness of the analysis. The qualitative data are reported alongside the quantitative data, adding richness and depth relating to the respondents' experiences of ERT.

2.3.3 Triangulation of Results

Multiple sources of data were included in this research in order to align several perspectives and lead to a more comprehensive understanding of the research question. In this research triangulation involved combining results from three data sources (i.e. the literature review, quantitative survey data and

TABLE 2 | Communication issues experienced during the initial lockdown.

Communication issues in order of importance (*n* = 65)	Average rank	1st (%)	2nd (%)	3rd (%)	4th (%)	5th (%)
Speed with which lock down occurred	2.9	23.1	29.2	35.4	1.5	10.8
Lack of communication or conflicting messages from organization	2.6	13.8	21.5	36.9	13.8	13.8
Immediate switch to block format, then out of block format	2.1	29.2	20.0	13.8	15.4	21.5
Media coverage emerging around AUT	3.9	20.0	20.0	7.7	35.4	16.9
Mastering new technologies (e.g. Teams, Zoom, Bb Collaborate)	3.6	13.8	9.2	6.2	33.8	36.9

qualitative open responses). A convergence of information from these three sources was used to explore various aspects of the research question.

3 RESULTS

3.1 Participant Summary

A total of 76 individuals were recruited and started the online survey. Of these 76 respondents, six did not answer any questions, one did not give consent, and two only completed demographic information. Therefore, data was included for 67 respondents for analysis (13.5% of target population). The median amount of time required for survey completion was 12 min.

Table 1 summarizes the key characteristics of the sample. Approximately 40% were aged 51 years or older. Half (50%) identified as New Zealand European. All four of the faculty schools were represented, however, half of the respondents were staff in the School of Public Health and Interdisciplinary Studies and only one staff member from the School of Sport and Recreation participated.

Regarding teaching experience, 32% of the sample reported between 11 and 20 years of experience. Twenty-three percent of respondents reported more than 20 years of experience, and 20% reported between six and 10 years. The remaining 26% had less than 5 years of experience. Half (50%) of the respondents had some previous experience with online teaching and 23% reported extensive experience. However, this experience may not have been current or involving the tools and materials that were available during lockdown. Therefore, because the contexts were so different, there were no comments about previous online teaching experiences in the survey responses. However, 27% reported the transition to ERT during the COVID-19 pandemic as being their first experience teaching remotely. The over-representation of educators who did not have experience working in digital platforms was concerning due to additional potential stress. Furthermore, learning in this space requires strategies which enhance student engagement (Pentaraki and Burkholder, 2017) which may not have been in the educator "toolkit."

3.2 Challenges Experienced

3.2.1 Communication Challenges

Participants were asked to rank several key communications issues (from 1 to 5) that eventuated during the lockdown period (**Table 2**). On average, the highest-ranking communication issue was the university-wide decision at the

beginning of the level four lockdown to switch to a block format of delivery from the previous semester delivery (average rank 2.1). This decision was reversed 2 weeks later, after consultation with stakeholders. In the interim, academics were forced to reconfigure calendars, due dates, and overall delivery of their courses with a subsequent return to original timetables.

On average, the second highest ranked communication issue was the lack of communication (or conflicting messages) from the University (average rank 2.6). However, only 14% of respondents ranked this as the most important issue. The next most important communication issue reported was the speed with which the lockdown occurred (average rank 2.9). New Zealand was given approximately 2 days (March 23–25) to prepare for the lockdown. Although on average, this issue ranked lower than lack of communications, a higher proportion (23%) ranked this as the most important. The next most important issue was mastering new technologies (average rank 3.6) with 14% of respondents identifying this as the most important communication issue.

On average, the lowest ranked of these communication issues was the fact that during the lockdown the university experienced significant challenges involving media coverage of senior staff along with negative stakeholder response to the block format (average ranking 3.9). However, 20% of respondents ranked this issue as the most important.

The challenges relating to communications were expanded upon in the qualitative data, whereby communication from management was sometimes experienced as an additional and frustrating stressor. A concern for the relational work involved was repeatedly reported. This encompassed work with students and colleagues which was expected of the university as a learning institution.

3.2.2 IT Resources and Support During Pivot to Emergency Remote Teaching

Figure 1 presents summary data on how academics scored the challenges relating to IT support that have previously been identified as key for the transition to ERT. On average, the most challenging resource issue reported was students' access to technology/equipment (average score 2.21). This is emphasized when examining the challenge categories where it was somewhat or very challenging for 91% of academics.

The second highest average score was finding a quiet space to work from home (average score 1.97). When looking across all three responses for this issue, approximately one third is reflected for each category. This indicates that for approximately one third
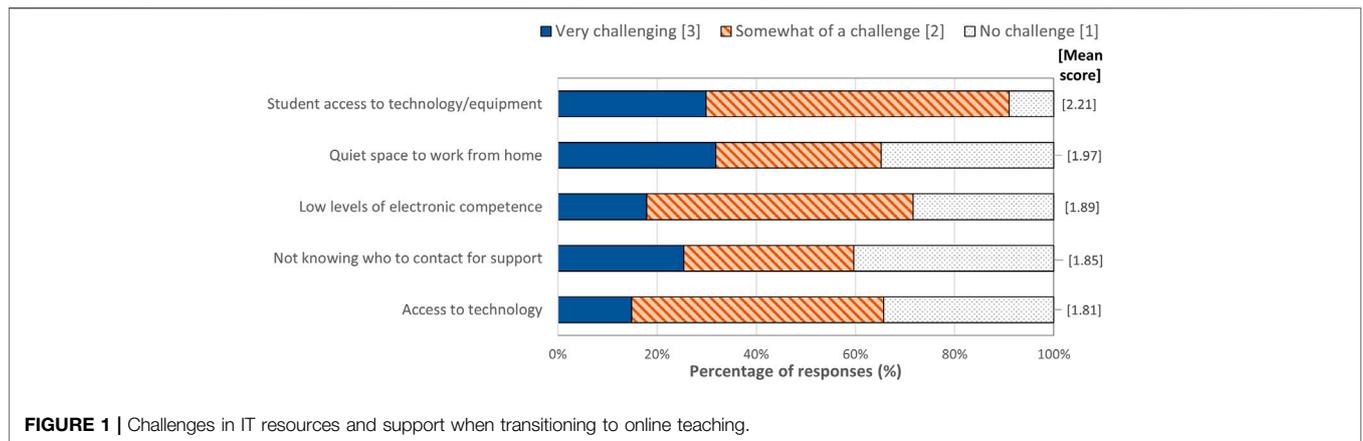
FIGURE 1 | Challenges in IT resources and support when transitioning to online teaching.
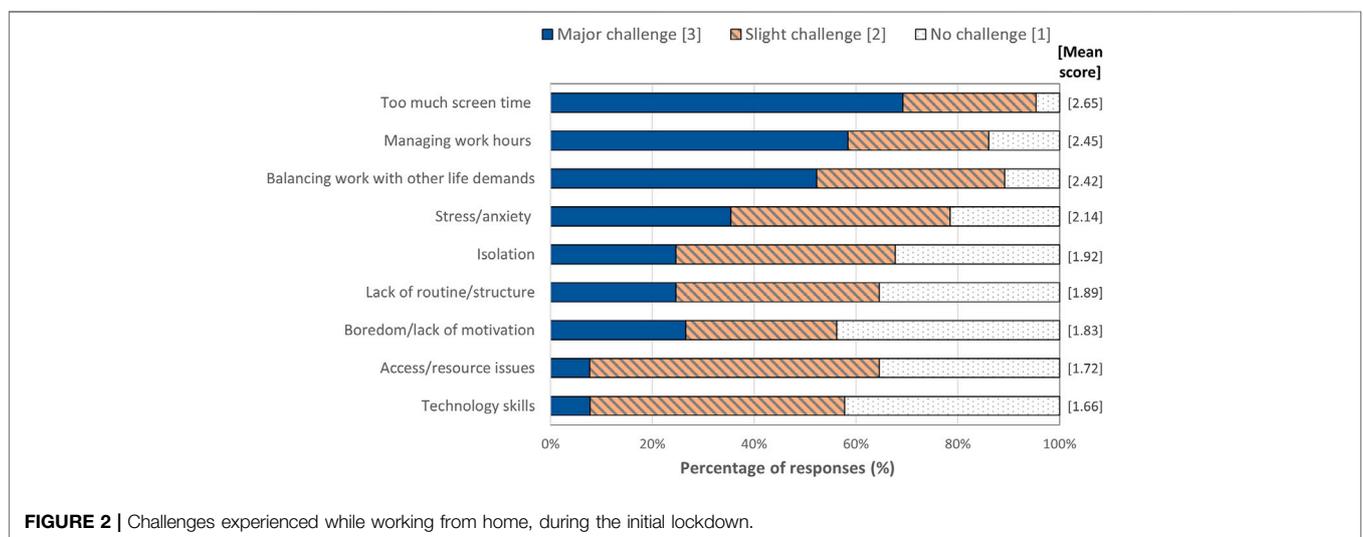
FIGURE 2 | Challenges experienced while working from home, during the initial lockdown.

of respondents this was not a challenge, but for two thirds of respondents it was somewhat or very challenging (65%).

The third highest average score in the area was low levels of electronic competence (average score 1.89). However, a majority (82%) found this only somewhat challenging or not challenging at all. This indicates that it was not an overwhelming issue for most respondents. Similar patterns were evident for not knowing who to contact for support (average score 1.85) and access to technology (average score 1.81).

These IT-related challenges were also reflected in the qualitative data. The abruptness of pivoting one's work into remote spaces relied heavily on expectations that academic staff and students would have the software, hardware and enough Internet connectivity to make this possible. While this was the case for most, respondents expressed concern for those who may be in a less privileged space. Such concern was framed as one of equity. Equity involved academic staff having both the tools required for ERT, and the skills involved to avoid student disadvantage. Some academic staff also struggled with how to make use of what was available.

3.2.3 Challenges Emerging When Working From Home
Challenges of working from home given the speed of the initial lockdown are presented in **Figure 2**. The highest scored challenge reported was too much screen time (average score 2.65). This issue was reported as a slight or major challenge for 95% of respondents.

The next highest challenges were attributed to managing work hours (average score 2.45) and balancing work with other life demands (average score 2.42). There was either a slight or major challenge for 86 and 89% of respondents respectively. Interestingly, the fourth highest average issue was stress/anxiety (average score 2.14) which was a slight or major challenge for 79% of respondents when working from home.

Isolation (average score 1.92), lack of routine/structure (average score 1.89) and boredom/lack of motivation (average score 1.83) all had similar patterns reported with 25–27% of respondents reporting that these were major challenges, with an additional 30–43% reporting some challenges.

The lowest rated challenges were access resource issues (average score 1.72) and technology skills (average score
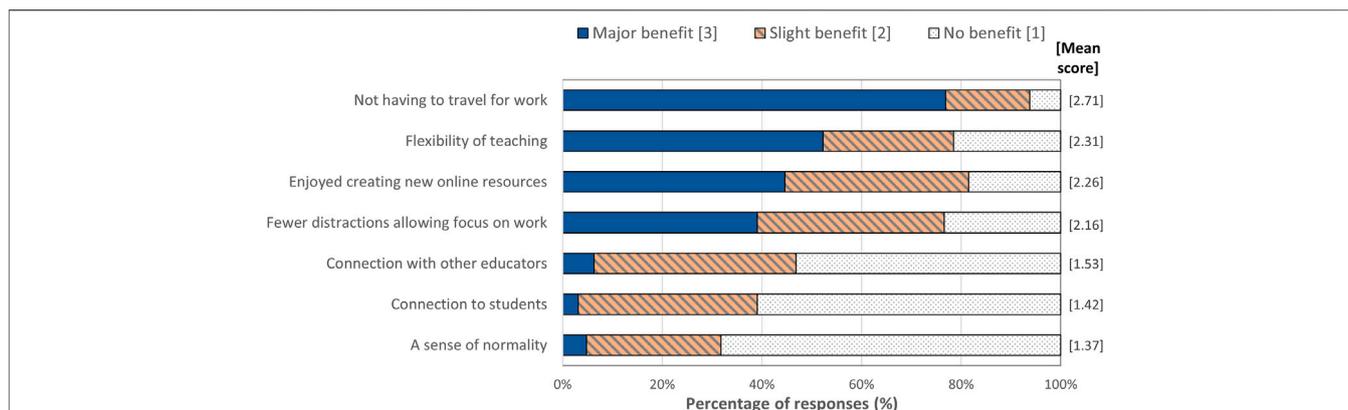
FIGURE 3 | Benefits of working from home during the initial lockdown.

1.66), however there was still a large proportion of the respondents who found challenges with these issues. While only 8% of respondents for both issues rated them as very challenging, there were 69 and 60% respectively who found there were some challenges present.

As reported in the qualitative data, the physicality of one's place of work remains an area of undeniable importance. Participants reported that the reconfiguration of space in which to work was challenged not only by the equipment availability (e.g. desks, chairs computers and monitors) but also by disparate factors. These included living in places poorly served by Internet providers, or where the Internet connectivity was insufficient for the demands of multiple people requiring access from home. Other academic staff reported an inability to find private spaces to engage in work-related conversations or from which to provide lectures or tutorials. Academic staff also expressed an empathetic understanding that the challenges they needed to negotiate were likely shared by their students.

3.3 Recognized Benefits of Working From Home

While difficulties were reported with working from home, there were some benefits reported from this experience (**Figure 3**). Survey respondents on average reported that not traveling to work was the most significant benefit (average score 2.71). A high proportion of respondents (94%) found this issue a slight or major benefit.

The next highest scored benefits reported were flexibility in teaching (average score 2.31), followed by an opportunity to create online resources (average score 2.26), with 45–52% reporting these new challenges eventuating from the lockdown as producing major benefits. The fourth highest scored benefit was having fewer distractions allowing for greater focus at home (average score 2.16). This is likely because a quiet home space may limit distractions by colleagues and other events occurring around buildings and on-campus areas.

The lowest rated benefits were connections with other educators (average score 1.53), connection with students (average score 1.42) and a sense of normality (average score 1.37). For these issues major

benefits were only reported for 3–6% of respondents, however of interest is that 30–40% reported that there were slight benefits.

Academic staff reported various unexpected benefits while working from home. Within the qualitative data, a surprising sense of togetherness was most evident. Despite geographical isolation, online media provided a platform for connecting with students and colleagues. Being able to utilize such spaces, both formally and informally, supported the collective purpose of staff trying to do their best by students. The novelty, as well as a pressured timeline, substantially increased the workload for most respondents. This took the form of reflecting on and developing new ways of working, needing to innovate, and creating or adapting learning and teaching resources. Strongly voiced in the open-ended responses was that this occurred within a strongly supportive and collegial environment. A sense of belonging within a community of similarly challenged others is evident with responses demonstrating empathy, trust and a non-judgmental space for staff to ask, share and practice with each other.

Academics were also asked about the positive aspects of online/ distance education (**Figure 4**). The highest average reported positive aspect was flexibility (anytime/anywhere learning) (average score 2.66) with 98% of respondents reporting that this was a positive or excellent benefit. This was followed by innovation in the teaching/learning spaces (average score 2.36) and customization of teaching with additional learning options (average score 2.18), both with over 90% of respondents reporting benefits. Next were the increased autonomy of learners (average score 2.08) and a wide range of software options (average score 2.02) with 75–80% of respondents reporting benefits. Lastly, engagement with students (average score 1.55) was reported, whereby over 50% reported no benefit but approximately 40% reported some benefit.

The positive aspect of working online is frequently identified in the literature as benefiting students with flexibility of time and space. Less commonly espoused, though strongly represented here and expanded upon within the qualitative data, is that flexibility is also greatly valued by those teaching online. Precipitated unexpectedly, but embraced by most, was the opportunity to critically reflect on one's own philosophical and pedagogical intent with how things might be done differently and for the better. The need and desire for
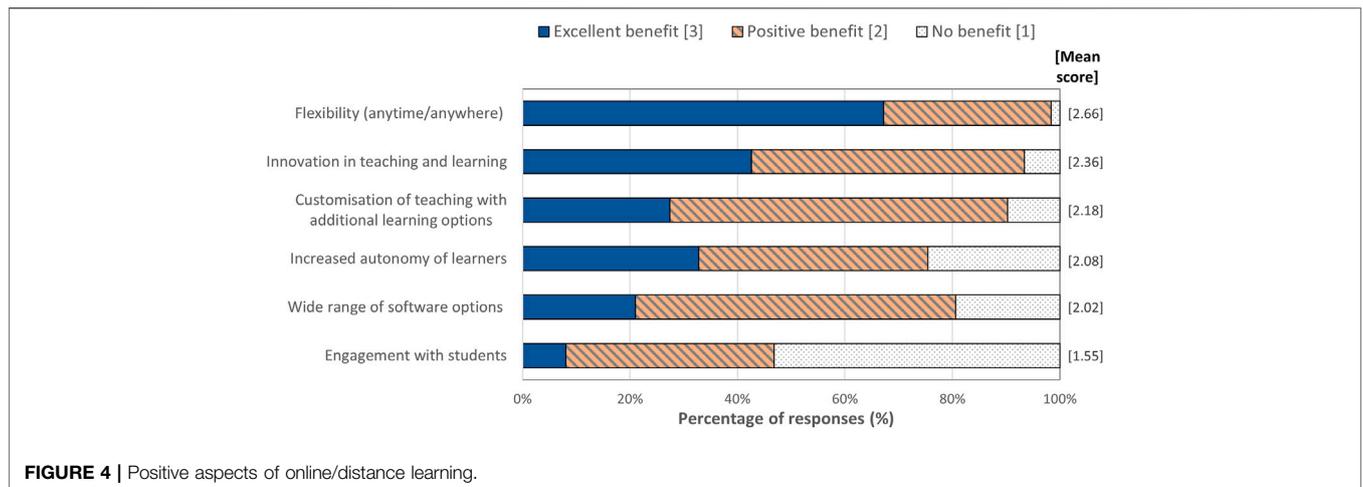
FIGURE 4 | Positive aspects of online/distance learning.

many to be innovative in the creation of new teaching resources was mostly described as a positive outcome.

3.4 Moving Forward

During lockdown periods, teaching and learning occurred exclusively online in an emergency mode. Given a lack of certainty as to what the future will hold, future directions remain of interest. Respondents were asked what they believed to be the ideal teaching/learning modes moving forward (**Table 3**). Blended learning (in the form of flipped classrooms) were preferred by 83% of respondents as the ideal path in the future. Twenty-four percent expressed an interest in virtual immersive learning (e.g. avatar, simulation, and virtual laboratories). Eighteen percent believed that a return to face-to-face delivery was the best option. Our moving forward is to an uncertain future with regards to delivery modes.

In the open-ended responses, there was strong support for modes of learning and teaching that would allow for continuing flexibility. There was an appreciation of wanting to become more capable and confident in working remotely. Valued was the ability to be creative and to make use of the online space in ways that were complementary rather than replicating what had previously been done. In contemplating what might be enhanced further, there was growing awareness that a blended learning model would likely alter what was done inside of face-to-face learning and online teaching. A change in the dynamics of the learning-teaching relationship was generally seen as increasing autonomy and support for students becoming more self-

regulatory and self-evaluative regarding their learning. As much as students are situated as learners, in this instance, academic staff position themselves as learners also. Taking this further, the university was required to learn of, and be responsive to, staff needs.

4 DISCUSSION

This research has offered a clearer understanding of the effects of the COVID-19 pandemic and subsequent lockdowns, on teaching practices in a health and science faculty at a university in Auckland, New Zealand. The results have highlighted several challenges and some potential solutions to ease the transition from face-to-face to online or blended modes of delivery in tertiary academic settings.

4.1 Communication is Key in Emergent Situations

The pandemic emerged quickly leaving academics feeling stressed, unsure, and unprepared for what was ahead (Rodrigues et al., 2020). There were instances where staff were directed by the university to take an approach which was contradicted shortly thereafter. Many academics found themselves navigating "shifting sands" in both teaching responsibilities and personal lives. Societal norms were in flux

TABLE 3 | Preferred modes of teaching/learning moving forward.

Ideal mode(s) of teaching/learning moving forward (*n* = 62)	No	%
Face-to-face delivery	11	17.5
Asynchronous online delivery	4	6.4
Flipped classrooms with both online and face-to-face delivery	52	82.5
Online live laboratory interaction and simulations	9	14.3
Virtual immersive learning (e.g. avatar, simulation, virtual laboratory work)	15	23.8
Artificial Intelligence driven learning	4	6.4
Other	4	6.4

with personal and professional lives thrown into a state of imbalance (Dwivedi et al., 2020). In the current study one of the complexities affecting the academics at the university was a need for clear and non-conflictual communication. This was evident in statements such as the following:

> "Don't frustrate staff with unclear or contradictory communication. Actively and honestly consult with staff as stakeholders for the best methods for moving forward."

As in other parts of the world, the academic staff at the University were forced to adopt new ways of remote working at short notice. Frustration was experienced with several respondents commenting on communications they experienced. Further lack of clarity was witnessed in the communications of the university with students through varied media (e.g. university learning management system, social media, University Facebook page, and the press). Staff wanted to be actively involved with decisions that would affect them in their working relationships with students.

4.2 IT Resources and Support When Transitioning to Emergency Remote Teaching

4.2.1 Equity and Engagement With Technology

In this study, the highest average concern for academics when pivoting to ERT was concern for students having access to technology. A study of New Zealand teachers demonstrated similar concern particularly for students in remote, rural and lower socio-economic areas (Flack et al., 2020). A survey performed by AUT uncovered a digital divide, whereby six percent of students did not have access to a computer or tablet at home, and 17% of students did not have broadband (AUT, 2020). The survey was processed through an online system and therefore may well have under-represented student needs. While the university provided laptops and data access packages for staff and students on request, this offer occurred through online platforms. The concern staff felt is best encapsulated in one respondent's statement:

> "Do not assume everyone has access to data or Internet connection…I don't and I'm a staff member!"

A statement such as this challenges assumptions made. The expectation that students or staff would openly disclose a need for assistance, let alone respond to online offers of assistance when they may have had limited access, demonstrates a flawed approach. Clearly the mode of communication needs to be broadened and offers of assistance more freely extended. It remains unknown if the above respondent did or did not request a data package during times when the campus was closed.

However, such challenges are not limited to hardware and Internet accessibility, as students and staff also needed to navigate the technology in meaningful ways. As expressed in the following

statement, knowledge of what was available was one issue, how to make the best of it another:

> "I wanted to really challenge the students with different formats of information delivery and interaction mediums however [I] had very little understanding of what was out there in this space."
>
> "Being forced to push myself to learn new tools and get as close as possible to reproduce what I do in class. Now I am thinking about how to not just try to reproduce but use both face-to-face and online in a complementary way. This enabled me to critically reflect on my teaching, including the sequence of activities used and what each teaching approach/tools enable doing."

For others the ability to engage differently seemed to come with some surprise at how engaging online learning could be.

> "I enjoy the flexibility of online learning and the flip classroom approach that places more onus on students to engage. I also enjoyed how some students really ran with the chat bar and other ways to use the features of the platform to communicate."

4.2.2 Challenges and Benefits of Working From Home

The idea of work/life balance is nothing new, but the pandemic accelerated imbalance in this area due to 'shifting sands' created by multiple unknowns. There is evidence suggesting that home-based telecommuting negatively affected work-life balance due to increasing work-to-life and life-to-work conflicts (Palumbo, 2020). Part of the reason for this is that working from home has the side effect of diminishing the ability of remote workers to handle the interplay between work-related commitments and daily life activities. This may increase work-to-life conflicts in the form of encroachment of work-related issues in everyday life (Sarbu, 2018). The resultant blurring of boundaries may also increase work-family conflict. However, some benefited from working at home, as the following response indicates:

> "I have appreciated that one can derive the satisfaction of delivering good teaching alongside spending time with the family."

Survey respondents on average reported that not traveling to work was a significant benefit of working from home with 94% citing this issue a slight or major benefit. Literature supports the idea that measures of stress (e.g. heart rate, blood pressure, skin conductance) are correlated with driving a car to work in some individuals (Paschalidis et al., 2019). By keeping people at home during the pandemic, academic staff may have experienced reduced stress by not travelling to work, as well as more time to complete work-related tasks.

When asked about working from home, the highest average score reported as challenging was too much screen time. Research confirms that visual fatigue and discomfort are induced by viewing screens (Kim et al., 2017). Screen time has increased

due to a multitude of factors including the need to create more resources, increased student communications, and increased team meetings. While screen time proved to be exhausting for many, this directly influenced the second highest average score of managing work hours. Eighty-six percent of respondents found this issue a slight or major challenge. Managing work hours is a smaller part of a bigger picture involving work-life balance, increased screen time, and increased student expectations. Working remotely in an emergency mode involved both benefits and advantages, which sometimes occurred concurrently.

4.2.3 Unexpected Benefits of Emergency Remote Teaching: Pedagogical Pivot Necessitated by Pandemic

When the level four lockdown was initiated in New Zealand, all universities were forced into emergency remote teaching and learning. While there were many challenges with the speed of the lockdown, there were also unexpected benefits discovered by academics working remotely. One such benefit supported in the literature (Roblyer et al., 2009) was increased focus and delivery of what was essential. Many staff reported enjoying the opportunity to revamp their courses to focus on crucial content:

> "[Working remotely] has forced me to focus on what really matters and I think my content is much better for it, there was lots of necessary stuff in my previous lectures [I was] forced to do careful planning and the material is much better for it."

Flexibility was another reported benefit of working remotely. While the pandemic forced emergency remote teaching and learning, many students choose to study remotely specifically for the flexibility, hoping they can combine their studies with multiple other responsibilities in their lives (Stone et al., 2019; Dhawan, 2020). This flexibility was described as benefiting students and academics alike:

> "Offering more flexibility for students juggling multiple commitments such as child-care and work."
>
> "[A] way for students to engage equitably-students have more time to consider content (can set their own schedule) and have multiple opportunities to review material & engage (especially asynchronously)."
>
> "[I] appreciated that students could learn from home, and I could work from home at a time when many were losing their jobs."

A further unexpected positive aspect of remote learning is the increased autonomy. Motivation (Latin "to move") provides the fuel for action and increases learner autonomy (Ryznar and Dutton, 2020). Motivation is moldable and can be enhanced by design elements such as generating student belief in the value of course tasks, and then encouraging them positively as to their ability to succeed (Daniel, 2020; Ryznar and Dutton, 2020).

Increased engagement demonstrates improved motivation as noted by one academic:

> "I enjoy the flexibility of online learning and the flip classroom approach that places more onus on students to engage. I also enjoyed how some students really ran with the chat bar and other ways to use the features of the platform to communicate."

Increased scope for creativity was also noted as a benefit in remote learning. Research tells us that the key to elevating the reputation of online courses is in giving the power of creativity back to the teacher (Wieland and Kollias, 2020). This process of what is done in the teaching environment was described as concurrently the same and different; that there was increased awareness of how one's academic role was being shaped as much as staff felt they were shaping their own work practices:

> "Collaborate Ultra allowed me to draw, write, upload slides... I felt I was teaching using a blackboard in the classroom... not really but similar to that."
>
> "I think there is room for further creativity when working online (loss of sage on the stage and more integrative/ immersive learning)."

While for some there is a sense that teaching remotely was forced, there is also an appreciation for the pedagogical pivot as a "next step":

> "[ERT] forced me to focus on what really matters and I think my content is much better for it, there was lots of necessary stuff in my previous lectures, forced to do careful planning and the material is much better for it."

4.3 Moving Forward
4.3.1 Developing Expertise as a Teacher in Online Spaces

With the need to develop capacity as an academic within online spaces, came increased awareness of the need to increase competency and confidence in one's work. Once access to the Internet and appropriate hardware are secured, the shift in focus becomes one of ensuring capacity and confidence (Roddy et al., 2017). A pedagogical shift prompted by the abrupt need to work online is evidenced by the desire to make more student-centric learning spaces:

> "The ability to create spaces online where students can access material and our support more easily has been an interesting experience…."

Noteworthy, were differing appreciations for how working online might influence or necessitate new ways of working. These are encapsulated within the commentary of responses ranging from doing what one had done previously but capturing this as a film, through to the development of ways of working that were enhanced by the online media. Evident is a thoughtfulness for moving forward in such unknown space,

"Lectures were recorded and uploaded on Blackboard for students to look at them at their own time and space."

"The ability to create spaces online where students can access material and our support more easily has been an interesting experience, though also increased workload as a result."

". . . however, working on new platforms (BBC, Panopto) took more time to prepare . . . ."

"Being forced to push myself to learn new tools and get as close as possible to reproduce what I do in class. Now I am thinking about how to not just try to reproduce but use both face-to-face and online in a complementary way. This enabled me to critically reflect on my teaching, including the sequence of activities used and what each teaching approach/tools enable doing."

During lockdown the focus appeared to be on managing the moment regarding supporting students as best as one was able. Supporting staff wanting to embed changes or expand skills moving forward becomes a concern for what Senge (2004) has termed the learning organization. Such organizations provide for enhancement of collective actions, recognizing that actions by individuals tend not to be sustained. Enduring changes are unlikely in the long term without systemic strategic support. Focused attention on the needs of the university, oriented toward facilitative ways of working as a learning organization, is key for future development.

4.3.2 Sustainability

The pandemic has highlighted that change and challenge are unavoidable concerns of modern life. Responsiveness to this unexpected event has provided an occasion for taking a more proactive approach. Since the lockdown period, many academic staff and students have chosen or are expecting remote teaching and learning to continue. An opportunity to consider sustainable changes proven effective in enhancing student learning and support is key in moving forward to a new normal.

In the context of the pandemic, some academics did not adapt their pedagogical practice to suit the online learning environment. Practices were limited to uploading existing teaching resources into the online learning management system. However, in-class assessments and examinations were required to be reconfigured for the online environment. Many staff recognized this minimal approach was a less than optimal response. Due to the ERT context, there was not time to consider how students interpreted tasks, took cues from peers, monitored progress, or adapted their approaches. The assumption was made that students had self-regulated in their learning.

Self-regulated learning involves developing an understanding of the task; setting goals and planning; applying study tactics and strategies; and adapting study for the future (Boud et al., 2018). The university did not have time to evaluate whether these abilities were intact for students (and encouraged by academic staff) when the shift to emergency remote learning occurred. Additionally, academics may not have recognized such

capabilities as important. Some academics stated they required further help in how to best support students:

"More guidance on effective use of remote teaching and learning that meets educational philosophies and pedagogical theories."

"[The university] needs to consider the quality of teaching and learning resources required for students in the future. This will require investment in the Instructional Design Team/IT infrastructure (i.e. LMS that is 'fit-for-purpose) to support lecturers in the development of a quality teaching and learning experience."

"[Being online] can only succeed if it is well resourced and driven by learning and teaching goals. If it is principally done to save $$ it will fail to deliver, and we will lose students."

"More immersive and asynchronous learning (but not just recording of lectures. . .). We need to learn to do this better."

Supporting students in the development of evaluative judgment is integrally entwined with student ability to self-regulate (Boud et al., 2018). Furthermore, evaluative judgment develops over time with students initiating and engaging with a number of significant self-regulatory learning strategies (e.g. strong internal feedback mechanisms). Students capable of evaluative judgment have high motivational regulation, high adoption of self-regulated learning, and better outcomes in academic performance. It is therefore timely for academics to explore ways of developing students' evaluative judgement, especially in remote teaching and learning environments. Challenges such as the shape of assessments, given examinations could not occur on campus, precipitated such discussions. The desire for further professional development was evident within the respondent's comments on the open-ended questions.

4.3.3 Flipped Classrooms Preferred Platform Into Future

While many respondents opted for a flipped classroom, there was no evidence of a cohesive understanding of what this might involve in the open-ended responses. The flipped classroom is a more recent pedagogical method, which employs asynchronous video lectures and practice problems as homework, and active, group-based problem solving in the classroom (Bishop and Verleger, 2013). As a sub-type of blended learning, flipped classrooms are emerging as a promising student-centred paradigm (Kemp and Grieve, 2014). It may therefore be more accurate to suggest that the majority of respondents supported a blended approach moving forward.

Blended learning is a broader category which combines traditional face-to-face learning and e-learning (Bernard et al., 2014). Consideration should be given to what motivates learners and how to best support student needs and demands. Blended learning adds a flexibility dimension to the traditional face-to-

face learning process along with improved academic achievement.

4.3.4 Avatar, Simulation, and Virtual Laboratories

Twenty-four percent of survey respondents expressed an interest in virtual immersive learning (e.g. avatar, simulation, and virtual laboratories) for the future. There are several applications for these learning platforms which have been useful both during the pandemic and beyond (Richey, 2020). Avatar-based learning has been shown to be effective in online teaching (Mkrttchian et al., 2020). Additionally, the use of three-dimensional multi-user virtual environments to provide learners with realistic scenarios in which verbal and non-verbal interactions are simulated has also shown promise in the online learning space (Tseng et al., 2013). The university has been interrupted in its development of these platforms in the climate of the pandemic. Presently, there is a heightened need for professional development of staff relating to course design and pedagogical underpinnings which will enhance all learning and teaching before investing in virtualization planned for laboratory and clinical skill development.

4.3.5 Institutional Leadership and Strategic Plan for Future

The challenges of what might be done and strategies for moving forward have never been more urgent for the university as a learning organization.

At the time of the pandemic many academics had never taught remotely. Many were working from what had always been comfortable. Others had embraced learning opportunities applicable to online spaces and were willing to share their expertise. The current experience was hugely reactive. In view of sustainability, the learning organization needs to examine what is needed in supporting staff who want to work more effectively in remote and online spaces. This would involve:

- Clarity as to purpose. Consideration of the philosophical and pedagogical possibilities in teaching and learning within online and remote settings.
- A need to review sustainability within our educational endeavors. This extends beyond a responsiveness of sustaining learning and teaching within online and remote spaces. Strategies for nurturing, developing and imbedding changes recognized by staff as enhancing the educational goals of their work needs to occur.

5 STRENGTHS AND LIMITATIONS

Strengths and limitations of this research must be acknowledged. The anonymous and online nature of the survey may have encouraged more honest responses. Respondents may be more likely to share personal information pertaining to sensitive opinions online (Gnambs and Kaspar, 2015) and anonymously (Fear et al., 2012; Merry, 2013). Ultimately using an anonymous online survey to collect data may have minimized the potential presence of social desirability bias (Joinson, 1999), such as respondents downplaying their negative experiences or refusing to share personal struggles that they may perceive as embarrassing. Additionally, the qualitative open-ended questions contributed more in-depth and rich data to the numerical data. Two coders independently coded the qualitative data and another two reviewed the codes. This added to the trustworthiness of the analysis by minimizing the possibility of misinterpretation.

A main limitation was the small sample size, which may have been caused by the restrictions imposed on the recruitment of respondents, with invitations to participate being predominantly restricted to on-campus signage. Ethical requirements limited recruitment to posters on campus and word of mouth in a time when many academic staff continued to work remotely. This influenced the sample size thus limiting the generalizability of the findings but does not detract from the valuable shared experiences.

6 FUTURE RESEARCH DIRECTIONS

Future research should include multiple universities with a goal of recruiting a larger sample size. Consideration around how familiar lecturers are with new technologies and different types of online and remote teaching, while realizing different levels of engagement, could provide rich areas of future investigation. It would also be appropriate to explore the differences between how courses are delivered before and after the pandemic along with the permanence of changes. Investigations into student experiences would also be of value knowing what learning and teaching strategies might be most positively received moving forward.

7 CONCLUSION

This study has highlighted the experiences and effects of the COVID-19 pandemic on educators pivoting to a remote teaching environment at a university in New Zealand. Many academics found themselves navigating "shifting sands" in both teaching responsibilities and personal lives. These challenges included conflicting communication from the university, non-standard access to IT resources, a lack of dedicated space to work from home, and excessive screen-time, all of which contributed to disruptions in work-life balance. More positively, the pivot to remote teaching enabled and encouraged flexibility and creativity, and an opportunity to reflect on what academics do and how this might be best achieved.

This research has brought to the fore a need to consider strategies to sustain learning and teaching even during challenging times. Reiterating the words of one of the respondents, "We need to learn to do this better." This research has provided an opportunity to consider staff responses and responsiveness during challenging times. Noted is an interruption to the assumed roles of learners and educators, with educators also embracing new learning opportunities. The university as a learning organization needs to consider sustainability by nurturing future possibilities in online and remote teaching and learning contexts.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

This study was approved by the AUT Ethics Committee (Reference 20/266) and all respondents consented to participate.

AUTHOR CONTRIBUTIONS

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Colliding Identities During COVID-19: Identifying and Addressing the Challenges of Being an Academic Mother During a Global Pandemic

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Academic workloads require a careful balance of teaching, research, supervision, and administrative responsibilities. Being an academic parent adds an additional level of responsibility to this, which has traditionally been successfully managed with organisation, careful planning and support. For many academic parents the Covid-19 pandemic disrupted this carefully curated balance, forcing them to work from home while also dealing with the loss of childcare and the requirement to provide homeschooling. The pre-existing gender disparity in childcare and housework was exacerbated by lockdown, with a disproportionate impact on academic mothers who were often forced to take on additional childcare and housework responsibilities, alongside remote schooling. The gender disparity further affected job stability, with women losing a greater number of paid working hours during the pandemic and having greater employment instability. This article reflects upon the impact of gender disparity in academic parents during the Covid-19 pandemic, and considers potential barriers to productivity and progression, including the role of interruptions, delivering sensitive materials in a workspace shared with children and technological challenges.

Keywords: COVID-19, academic, challenges, parent, pandemic

INTRODUCTION

In July 2020, the New York Times stated "in the Covid-19 economy, you can have a kid or a job. Not both'. Working parents who had previously carved out clear boundaries between their professional identity and their role as a caregiver, suddenly found themselves working from home, with their children not only perpetually present, but now requiring attention, support and in many cases home-schooling. This burden has been found to disproportionally affect women at both the physical level of work, such as the number of hours able to be worked, and the cognitive load that is associated with such work (Czymara et al., 2021). The implication of this for many mothers working in higher education, was that the obligation to support and teach their students suddenly sat alongside the need to teach their own children and support them as they navigated the impact of a global pandemic on their own lives. Inevitably, the slew of challenges that arose from the competing roles of both academic and parent while in the same house (or even sitting across the same table) did not allow for those previously crafted boundaries to remain in place, resulting in a decrease in the productivity of many academic women during this time (Brown et al., 2021) and an increase in parental burnout (Aguiar et al., 2021). This article reflects upon the impact of the Covid-19 pandemic on gender disparity within working parents, and specifically in relation to obstacles faced by academic mothers

during the pandemic, as they sought to reconcile two distinct identities as professional and parent, while traversing a range of barriers to productivity. These barriers included the impact of gender disparity on caregiving and professional output, learning to engage with new technologies or the lack of uninterrupted time in which to work.

GENDER DISPARITY

Prior to the COVID-19 pandemic, it was well-documented that women assumed a greater proportion of household and childcare responsibilities than males, In contemporary couples within the United Kingdom, women took on a disproportionately high level of housework, childcare and additional caring responsibilities (Xue and McMunn, 2020) and this remained true even in households where both parents worked full time hours (Office for National Statistics, 2016). Theabaud et al. (2019) suggested that this disparity may be rooted in clear expectations for each gender, with women being held to higher standards of cleanliness within the home than men. Additionally, they suggested that men are generally perceived to suffer more negative social consequences than women if they fail to meet these standards, while women are considered to be more responsible for housework across a range of work and family arrangements. Against this pre-existing background, it is perhaps unsurprising that the additional burden of childcare and remote schooling created by the Covid-19 pandemic fell primarily to women.

The sudden loss of childcare facilities associated with the pandemic created a substantial increase in caregiver responsibilities including for many, the need to undertake remote schooling. Xue and McMunn (2020) determine that each week during lockdown, women spent an average of 5 h more doing housework and 10 h more doing childcare when compared to men. Adams-Prassl et al. (2020) analysed time-use data to determine that amongst the population working from home during the Covid-19 pandemic, women spent significantly more time homeschooling and undertook significantly more responsibility for childcare than men. This increase in caring responsibilities and housework was associated with higher levels of psychological distress for women and may have future implications for mental health (Xue and McMunn, 2020). This psychological distress may be due in part to the increased anxiety and mental load carried by women during lockdown. Czymara et al. (2021) determined that women were consistently more worried than men about how to manage childcare alongside work, and the challenges associated with achieving the balance of meeting children's needs alongside the requirements of their job.

The gender disparity associated with security of employment may also have added to womens' psychological burden, with women found to be reducing their paid working hours significantly more than men during the pandemic (Czymara et al., 2021; Xue and McMunn, 2020) In addition, significantly more women than men lost their employment since lockdown began (Farré et al., 2020). This suggests that gender inequality has risen in terms of both paid and unpaid work during the pandemic, which must be addressed if we are to avoid

contributing to a further widening of the existing gender pay gap during the recovery process from the pandemic (Czymara et al., 2021). The implications of the lockdown on gender disparity can be examined through the lens of academic mothers, in order to identity and reflect upon the specific challenges that are faced, and how the gender disparity contributes to these.

Productivity

Feng and Savani (2020) sought to identify changes in work-related productivity and satisfaction in the context of the Covid-19 pandemic. They found that women reported a greater perceived loss in both productivity and job satisfaction than males, though this may be limited by the pre-covid scores for both measures being obtained retrospectively and therefore being slightly less reliable. The impact of this on the productivity of academic mothers specifically, is illustrated by the statistics around who submitted to academic journals during lockdown. While the number of men submitting articles increased, the number of submissions from women fell significantly compared to the previous year (Vincent-Lamarre, Sugimoto & Lariviere, 2020). Squazzoni et al. (2020) found that this trend continued in research papers related to the impact of Covid-19, and was particularly notable in senior female academics who had a PhD, and therefore were most likely to be of the age where they had childcare responsibilities. Unfortunately, this means that those academics who were most affected by the pandemic have also been the least able to add their voices to the conversation around it. This creates an unfortunate paradox: if we only hear the voices of those less affected by these changes, then how can we fully understand and appreciate the impact of the pandemic on all academics, especially academic mothers whose productivity has been so affected? Given the gender disparity, it is essential to listen to the voice of academic women, and particularly academic mothers, in order to avoid a situation where these valuable perspectives are missing from the discussion.

Lack of Uninterrupted Time

Academics are only too familiar with interruptions, even prior to the Covid-19 pandemic. From the student who knocks on their office door just as they're starting data analysis, to the urgent email that pings through to their computer and requires a response straight away. The working day is traditionally punctuated by these interruptions and academics have become used to dealing with them and getting straight back to work, safe in the knowledge that if they need an undisturbed chunk of time, they have a range of strategies available to them; going to another office space, mute their emails for a few hours or simply putting a 'do not disturb' sign on their office door. These uninterrupted periods of time are essential to productivity, in order to avoid errors and delays in the time taken to complete the task (Cole et al., 2016) therefore one of the most difficult losses for academic parents was the opportunity for uninterrupted work. This was particularly impactive during lockdown when, for many households, everyone was now at home, doing work, remote schooling or just requiring attention and supervision that had

previously been provided by childcare facilitators for a portion of the day. The unequal burden of childcare and remote schooling that fell on women (Xue and McMunn, 2020) meant that women were significantly more affected by these type of interruptions. Additional challenges such as a school's safeguarding requirement that children do not engage in any online school activities from a bedroom created further barriers to achieving an uninterrupted workspace.

For many academic parents now taking on the burden of childcare and remote schooling, periods of previously uninterrupted academic work were replaced with shorts bursts of activity, interspersed with frequent interruptions. During lockdown, meals, activities, learning and attention that used to be provided throughout the day at school, now had to be provided by parents, creating not only an additional physical load, but a vastly increased mental load. Grandparents who could previously have been relied on to help out with childcare and offer a little breathing space as deadlines approached or the marking piled up, were now no longer able to visit and could only provide some distraction for their grandchildren for as long as the children were prepared to sit in front of a laptop. A lasting memory of the lockdown for this academic parent will be watching my child conduct a science experiment about absorption when they were in South West England and the experiment itself was taking place in Scotland. Over a zoom meeting, various substances were poured, while the young scientist watched the screen intently, timing each event. This attempt to provide some interruption-free time, while an excellent idea in theory, in practice actually turned into a running commentary about what was happening at each step of the experiment so 'uninterrupted work time' became 'science theatre time' where the academic parent was forced into the role of enthusiastic audience member, clapping and cheering as muddy water was filtered through a t-shirt 300 miles away. Making memories? Defintely. Making deadlines? Definitely not.

Of course, some types of interruptions can actually be positive and assist with multi-tasking by keeping the worker alert (Brumby et al., 2019). Abdullah et al. (2016) found that interrupting long periods of work to take breaks can increase focus and creativity. However, this positive effect relies on interruptions being self-determined, and falling at a natural place in the work. A child suddenly demanding food or attention is unlikely to meet these criteria. It may be that they simply cannot avoid interrupting your webinar because their teacher wants them to print their algebra worksheet right now, or their laptop just shut down unexpectedly and they require immediate assistance. These interruptions, innocent as they are, fall into the category of external interruptions and can have a significant negative impact on productivity, leading to a chain of interruptions that reduces productivity for several hours (Iqbal et al., 2005). Simply getting back to the task at hand as quickly as possible may not provide the solution as external, non-work-related interruptions require some recovery time and attempting to resume the task too quickly after such an interruption can lead to errors. Taking this knowledge on board could potentially allow the academic parent to wait for a period before resuming work following an interruption, in order to maximise productivity. However, the additional demands created by working and parenting through a global pandemic did not allow the luxury of choosing exactly when to resume work as those who took on the additional childcare responsibilities had to fit their work around their childs' schedule. Academic work was fitted around new responsibilities. Papers were written in the early hours of the morning, telephone interviews had to be conducted in the car to avoid background noise and emails were responded to on phones whenever a few minutes allowed. The work may have gotten done eventually, but the price paid to achieve it was great, and was significantly higher for women than for men (Hipp and Bünning, 2021).

Discussion of Sensitive Topics

The challenges of remotely delivering lectures, or having academic discussions - with children present - are not only to do with being interrupted. There may be some subject areas that are necessary for an academic to discuss, which are simply not suitable for children to hear. As a senior lecturer in forensic psychology, who leads a bystander intervention programme to tackle domestic and sexual violence, the move to conducting lectures from home posed some specific challenges around how to delivering sensitive topics while not exposing children in the household to those sensitive topics. For example, while it may be logistically possible to teach a class from the same room that your child is reading or working in, if that session is focusing on violent behaviour or the impact of intoxication on the ability to consent, suddenly things become a little trickier. This issue may be resolved by simple logistics: put the children at one side of the house and deliver the sensitive subject from a far-away room. However, this can be hampered by a number of factors, such as the wi-fi range within the home and the age of the children and their ability to remain unsupervised for any length of time.

This issue may also affect students who need to discuss their course subjects with their tutor, or want to have a private conversation about personal challenges that they are facing. Even if a student could guarantee a safe and private space in their own home, they may not feel confident that their tutor can offer the same. This could result in discomfort or reluctance to share concerns about their studies or personal circumstances with academic staff. Unless academic parents have a private office in their home, it is extremely difficult to guarantee complete exclusion of the background noises of family, televisions or even pets, however quiet they are attempting to be. Unfortunately, at a time when many students are anxious about the potential impact of the pandemic on their studies, the challenge of finding a safe and private space for open and honest discussions has the potential to diminish the effectiveness of personal academic tutors, just at a time when students need them more than ever. As childcare responsibilities were taken on by a disproportionate number of women during the pandemic, such logistical challenges would be more likely to fall to academic mothers, further increasing the gender gap in relation to productivity and job satisfaction (Feng and Savani, 2020).

Technology

In the event that an academic parent has found solutions to the challenges of uninterrupted time and locating a private and safe

space to work, it might be supposed that they are now able to work productively, even perhaps reaching the same rate of productivity as pre-pandemic. Unfortunately, this is still not guaranteed as working outside of the office environment in the absence of equipment, technical support, or even consistent and reliable wi-fi led to parents being forced to choose between competing activities that required access to technology and sole use of the computers and wi-fi bandwidth (BBC News, 2021). Decisions had to be made about whether a child should attend their online teaching session or whether the parent could attend a professional webinar that was running at the same time. The impact of these technological challenges highlighted the importance of academics having the right technology to be able to carry out their jobs effectively, as well as shining a light on the problems that can arise when academic parents are required to use their own private technology for both home working and remote schooling. As women are more likely to be taking on the additional burden of childcare during lockdown, they are also likely to be disproportionately affected by having to use their technology for remote schooling and therefore reducing their ability to work effectively, creating yet another barrier to their academic career.

CONCLUSION

The gender disparity which existed pre-Covid has been inflated due to the increased childcare and housework burden placed upon women during the pandemic. This has created a reduction in productivity, and in the ability of women to do their jobs effectively and efficiently, aligned with increase in psychological distress and greater job instability. With burnout among academics already well-established, and over 70% of higher

education staff reporting experiencing feelings of high stress during their career (Kinman and Wray, 2013) it more important than ever to acknowledge the disproportionate burden that has been placed on academic mothers during the Covid-19 pandemic. It is important to acknowledge that working in academia does come with its own privilege, and it would be remiss to discuss this issue without acknowledging the privileged position that academic parents are in with regards to relatively good job security, ability to work from home rather than face furlough or unemployment, and the stability that comes with being part of a large organisation such as a university. However, the challenges faced by academic mothers are still very real and must be acknowledged and addressed.

The unique challenges of managing the conflicting roles of academic and parent during this pandemic are undeniably great, and may even appear insurmountable, but it is hoped that with empathy and acknowledgement of these challenges on the part of colleagues, organisations and students, they can be overcome, ensuring that higher education remains an inclusive, respectful environment where everyone can flourish.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

GH is the sole author of this submission and is accountable for the content of the work.

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Defending Campus Culture Against the Threat of Perennial Online Instruction in a Post-COVID-19 World

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Until recently, higher education was a mainly in-person institution. Students either commuted from their homes to nearby campuses, or they lived at school, in campus accommodations or in nearby private housing—all so they could more easily access and spend time on the college campus. This is because higher education settings are so much more than just "information delivery systems," they are, as Herman (2020) reports, ". . . like small towns." They are sites for the development of students as not just *learners* but also as *people* and *citizens*.

While many degree programs offer online courses and distance learning[1], colleges and universities have traditionally been physical sites that consist of in-person classroom instruction and interaction. We argue that it is this physicality of colleges and universities that fosters social interactions, orchestrating the conditions for the creation of *communities of learners*, which further facilitates personal and intellectual growth. We see this as "campus culture" and argue that it is both the condition for, and the product of, *student flourishing*. We further argue that it is something essential to the higher education, and therefore, should be protected, at a time when so many would like to see higher education permanently move off campus and online (e.g., Dhawan, 2020; Frankfurt, 2020; Govindarajan and Srivastava, 2020; Lockee, 2021; Taparia, 2020, May 25).

We are, as Aristotle thought, social animals. By that argument, learning should be seen as a communal activity. Moreover, it is made possible by the development of certain kinds of virtues–what have been called "intellectual virtues," such as *curiosity*, *love of learning*, *open-mindedness*, and *intellectual humility*. These are the virtues people need, in order to pursue truth and knowledge (Baehr, 2017). Learning as a communal activity is also made possible by "interpersonal virtues" of *cooperation*, *mutual respect* and *good will toward others* in the class, and by the creation of *norms of trust* that allow students to learn in a space in which they know their contributions will be valued. In an important sense, universities do not just teach *subjects* like philosophy, psychology or business; they teach *people–who learn from each other* as much as they do

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[1]The empirical and popular literature consulted in writing this paper, uses a variety of terms when referring to "online learning." These include, but are not limited to: e-learning, distance learning, computer-assisted learning, edtech, asynchronous teaching, web-based learning, digital learning and remote teaching. Since the start of the COVID-19 pandemic, the term "remote teaching" has taken on a nuanced quality, which sets it apart from these other concepts. To explain: in the case of the other terms, these reflect teaching/learning settings or contexts that are intentionally designed to be delivered online—that is, courses/curriculum delivered via some form of technology that does not require students or teachers to be together in the same physical space. Remote teaching (often preceded by the term "emergency,") is a situation where, due to the exceptional circumstances of the global pandemic, and the need for social distancing, campus closures and/or lockdowns, teaching (and learning) had to be done "remotely"—which usually meant from the homes of those doing the teaching. Despite the delivery being online, "emergency remote teaching" (Hodges et al., 2020) is an altogether different situation, where classes designed to be held on campus and in-person have been forced into online formats that were not part of their original design.

from their professors. Together they develop intellectual virtues and virtues of social cooperation, which we believe can only be achieved when in the company of others.

By being in-person and together on campus, students are also better able to make new acquaintances and form friendships that go beyond the boundaries of the classroom (Eve et al, 2014). Importantly, students also develop a sense of identity and belonging. The social opportunities and interpersonal interactions made possible by in-person and on-campus attendance help students to see themselves as parts of a greater whole; connecting their personal good with that of the school, thereby contributing to its good, and enhancing the lives of fellow students—which in turn enhances their own lives.

Consider the kinds of social interactions that occur on campus, through students' engagement in groups and organizations such as (e.g.,) a campus Gay Straight Alliance; or in the context of a multicultural student center. Students engage with other students who might feel disenfranchised or who lack a sense of true belonging (Lefever, 2012). Such campus groups and settings can help students to overcome feelings of loneliness, depression, or alienation. It is also in these settings that students often form lasting friendships (Alemán, 2010; Gareis et al, 2019). Lending support to our claims, Gable (2016) compared the experiences of first-generation and continuing-generation students. She reported that for both groups, a student's path to "thriving" included "*making friends from a variety of backgrounds. . . (and) . . . committing (to) an extra-curricular organization preferably early in college.*" (Gable, 2016, p. 221).

In short, colleges and universities, with the help of the student organizations within—and the *campus culture* that is created—are microcosms that quite literally (if not physically), surround, support and aid students in myriad ways. This includes helping students form meaningful friendships and develop social networks; and helping with learning—not just the attainment of knowledge in pursuit of a degree, but learning about oneself—as an individual and as part of something bigger. These are some of the interpersonal and associative skills that underpin the *intellectual* and *interpersonal virtues*, which in turn, translate to becoming good citizens (Peterson, 2017). Interestingly, universities are increasingly being looked to as places that produce *global citizens* (Braskamp, 2008; Grimwood, 2018).

In 2020, the COVID-19 pandemic forced educators to revisit the pros and cons of online teaching and learning with greater urgency. Partisanship was evident in the popular press and higher education "trade" journals, where authors enthused about the benefits or detriments of online learning; at the same time, intimating that the other is second-rate or second-class.

In a proponent opinion piece in the New York Times, Taparia (2020) made a case for the financial benefits of online learning; it is cheaper and cuts college costs considerably. Also, clearly in the pro camp was a Washington Post article, whose title was all that was needed to know what side of the divide it fell; "Cuomo questions why school buildings still exist—and says New York will work with Bill Gates to 'reimagine education'" (Strauss, 2020). From Forbes, Frankfurt (2020) offered a strongly pro message wherein he concluded: "*If this global pandemic has taught us anything, it's that the importance of online flexibility is absolutely critical for the sustainment of education and overall well-being.*" (Frankfurt, 2020, para. 10). He's not wrong, objectively speaking, in terms of the sustainment of education, at least so long as the pandemic rages across the globe. As for well-being, we're not convinced.

Meanwhile, on the other side of the divide, in an opinion piece from *Inside Higher Ed* entitled "Online Learning is not the Future of Higher Education," Herman (2020) reported on the findings of his own well-timed study: with the move to online learning taking place in the middle of the term, an opportunity arose where students could "*compare the digital with the analog versions of their classes.*" (para. 7).

Herman asked his own students, who he described as being "*digital natives*" (suggesting they'd have no bias against digital technologies), to write about their experiences of online education. After roughly factoring in the major demographic variables (e.g., age, gender, ethnicity, etc.) Herman concluded, ". . .(T)hey hated it. . . All told, moving online caused 'a profound sense of loss.'" (Herman, 2020, para. 9).

In deconstructing the students' comments, to better understand their dislike—and taking the pandemic-related variables into consideration—he deduced that the issue was the *asynchronous* nature of pre-recorded lectures and podcasts; no longer having a specified class time meant that students were essentially taking their classes alone. Missing out on *human interaction* turned out to be the essential factor fueling their extreme dislike of online learning. "*The farther a class got from face-to-face, the less students liked it, and the less they got out of it. Conversely, the closer a class got to approximating the traditional classroom, the better.*" (Herman, 2020, para. 19).

More than a year on from the start of the COVID-19 pandemic—and the commensurate move to 'emergency remote online teaching/learning'—another opinion piece from *The Times Higher Education* reports that students are missing on-campus learning, adding a new angle of support for the con position. "*The experience of online learning from their parental home has made many students keener than ever to study in face-to-face settings alongside new friends, far away from where they grew up.*" (Hillman, 2021, para. 13).

Turning to the empirical research, while somewhat mixed in their overall findings, studies generally report that students are more often dissatisfied with their online learning experiences (Abbasi et al, 2020; Bouhnik and Marcus, 2006), and that face-to-face learning is often preferable to distance learning (e.g., Picciano, 2002; Bali and Liu, 2018; Castle and McGuire, 2010)—both prior to and during the COVID-19 pandemic.

Nevertheless, online learning has been found to be effective in knowledge transfer/learning (Anggrawan and Jihadil, 2018); to promote critical thinking skills (Mansbach, 2015); and it limits the carbon intensity of course delivery (Castle and McGuire, 2010). Aspects of online instruction have even been found to meet weaker students' extended teaching needs (Brecht and Ogilby, 2008). The temporal freedom to progress through a course of study at one's own pace is another frequently cited benefit of online learning (e.g., Anderson, 2008). It has also been reported that while campus-based education has numerous advantages, for first-generation students, the anonymity provided by its digital

complement can sometimes have greater benefits (van Belle and Kaag, 2021). To their credit, some distance educators have also shown that they understand the importance of communication, social presence and social interactions as features that should be incorporated into online learning (Khoo and Cowie, 2010; Bali and Liu, 2018; Nguyen et al., 2021).

The positive benefits of online learning notwithstanding, we argue that moving all teaching and learning online would sacrifice the positive benefits of an in-person interactive learning community, with its reciprocal social interactions and engagement with student groups; it would be the loss of *campus culture*. While we do believe that some online environments are able to create a sense of classroom cohesiveness, foster valuable interactions among students, and provide some conditions for learning and personal growth, this is by no means guaranteed. Small online class environments are more conducive to facilitating these kinds of goals; it is arguably more difficult to achieve such goals when online class sizes are very large, or when they are designed to be asynchronous.

To illustrate from our own experiences, in the second author's online class during the spring of 2021, there were seventeen very good students and wonderful classroom interactions. This would not likely have been possible with a much larger group. In the first author's large undergraduate class of 300-plus students—which was not designed to be delivered online—a little more than 100 attended the first "live online" lecture, remotely delivered (and recorded) during a lockdown period from her laptop at home. That number dropped successively lower with each passing week. By the end of that semester, only 30–40 "regulars" were still attending the live online lectures. Whatever the reasons (e.g., technology, motivation, time-tabling, connectivity, home environment, teaching quality, other COVID-19 concerns, etc.), these are not the descriptions of vibrant, thriving educational experiences.

Students who attend in-person classes, unlike those who learn online, can leave their classrooms and encounter a rich real-time, in-real-life (IRL) campus environment, where learning continues—with peers as well as with mentors (e.g., professors, counselors, and advisors). Students can feel part of a larger community, and sometimes part of larger educational traditions that span decades, if not centuries. They can learn to become good "citizens" of their wider communities. (As an example, if students believe that their universities are implicated in injustice, they can lobby for change.) Students can also develop their ideals and act on them in the company of like-minded others. These on-campus IRL experiences are formative in students' lives, and the friendships they make while in college can last a lifetime.

In the face of the mutating COVID-19 virus, concerns for one's own—and one's students'—health and safety need to be paramount. Social distancing, and periodic lockdowns, which are sure to continue, foretell circumstances that will most certainly challenge broad scale return to campus life as we knew it. And while we would argue against online education becoming a permanent substitute to a campus-based education, we acknowledge that some forms of "emergency remote teaching/learning" may be necessary for a period of time.

As such, in the context of the COVID-19 pandemic and its repercussions, there is reason to temporarily consider a more complementary teaching and learning approach. This could involve distance learning and/or "emergency remote teaching" (Hodges et al., 2020) during lockdown phases, and a return to in-person on-campus instruction when and as it is safe to do so (e.g., Nordmann et al., 2020; Verde and Valero, 2021). However, we vehemently contend that the value of *campus culture* for students to develop and flourish, needs to be acknowledged and factored into any judgments about the relative merits of online and in-person learning; and planned for in any decisions about the "future of higher education".

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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COVID-19 and Rapid Course Adaptations in Saudi Arabia: An Experiential Learning and Recommendations for Online Education

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The COVID-19 Pandemic has severely impacted educational systems around the globe, necessitating rapid modifications to the educational milieu while safeguarding human health and wellbeing. Following the closure of universities in Saudi Arabia, the instructors of all theory courses were mandated to switch from face-to-face course delivery to remote teaching and learning. This research examines the challenges and impacts of the COVID-19 Pandemic on the mode of teaching and learning and the numerous adaptations in the pedagogical framework of the Landscape Architecture program at Imam Abdulrahman Bin Faisal University, Saudi Arabia. It also explores the opportunities the transition to online education presents to faculty and students moving forward. The data were collected using an online questionnaire survey and focus group discussions. Data analyses consisted of descriptive statistics and thematic content analysis. The research finds that the sudden transition to online teaching and learning disrupted academic activities and had negatively affected the existing teaching and learning framework. Therefore, the research recommends an adaptable and dynamic teaching framework agile enough to cope with sudden disruptions. It concludes with lessons for future teaching and learning frameworks and amendments for upcoming sessions to deal with similar situations.

Keywords: course adaptations, online education, student satisfaction, emergency remote education, COVID-19, experiential learning, higher education

INTRODUCTION

The World Health Organization (World Health Organization [WHO], 2020) declared on 11 March 2020 that the COVID-19 has become a *Pandemic* after infection cases reached more than 100,000 worldwide. As the COVID-19 continued to spread at an alarming rate, many educational institutions around the globe were forced to shift to online or remote learning options, which caused some teaching and learning challenges among faculty members and students (Marinoni et al., 2020). The situation indicates that educational institutions should be resilient and swift to make necessary decisions and adaptations to ensure proper teaching and learning in challenging

times. In addition, researchers suggest that institutional and infrastructure support are important in ensuring the quality of online education (Jones, 2014; Lederman, 2020).

During the Pandemic, the transition to the online environment has required instructors to modify their teaching practices, including assignments and exam formats (Johnson et al., 2020). Because the conventional techniques for assessing student success are not compatible with online settings, modes of course delivery require modification (Serwatka, 2002). While some researchers such as Herrington et al. (2001); Mayes et al. (2011) stress the importance of group work and collaboration in online learning, Dumford and Miller (2018) posit that students taking online classes might experience less collaborative learning. Likewise, Driscoll et al. (2012) emphasize adjusting teaching strategies and methodologies to conform to the requirements of digital technologies. These adjustments include using information and communication technologies (ICT), remote teaching strategies, and untested methods (Driscoll et al., 2012). The sudden transition from face-to-face teaching to remote or online modes of teaching necessitated many abrupt and untested modifications. Therefore, the outcomes of such adjustments can only be revealed as the courses progress (Iqbal and Tayyab, 2021). The transition has notably resulted in an increased workload for instructors and a challenge to shift existing courses designed for face-to-face to an online format (Kaden, 2020). On this account, it is safe to add that online education adaptation requires adopting different teaching methods, which require testing and putting the needed support in place, including guidance, technical and moral supports (Marinoni et al., 2020). The Pandemic challenged educational institutions and the telecommunication sector to meet the high demand for educational technologies from students and faculty. The extent of satisfaction with online teaching and learning depends upon the preparedness and the infrastructure provided by each academic institution.

In Saudi Arabia, the Ministry of Health officially reported the first COVID-19 case on 02 March 2020 (CNN Arabic, 2020). On 08 March 2020, the Ministry of Education suspended the face-to-face mode of education in all educational institutions in the country, mandating them to switch to online or virtual learning modes (Alarabiya News, 2020). The Ministry further advised universities to develop their strategies of switching to the online mode of education and facilitate meeting the needs of faculty and students. Before the Pandemic, e-learning tools, and online methods of teaching in Saudi Arabia were limited (Alali and Xanthidis, 2014; Rajab, 2018). However, some researchers have speculated extensive use of e-learning systems to help students gain wider access to higher education and overcome cultural barriers (Alali and Xanthidis, 2014; Xanthidis et al., 2016; Aldiab et al., 2017; Abubakar et al., 2020). Also, Rajab (2018) indicates that online education provides a safe learning environment for students and can deliver quality education. However, during the Pandemic, technical and technological issues have been highlighted as some of the most crucial factors to be considered for effective e-learning systems (Almaiah et al., 2020).

Imam Abdulrahman Bin Faisal University is among the Saudi universities that suspended all face-to-face academic activities, including classes, training, and workshops during the

Pandemic. As such, the University management ensured that while academic activities continue virtually, the health and wellbeing of the students and staff are safeguarded. Furthermore, the University management swiftly provided technical support and extensive training workshops on using various software and applications such as videoconferencing through *Zoom* and using the *Blackboard* and *QuestionMark* for online quizzes and exams to facilitate learning delivery in all programs. These adaptations seem to be unanimously adopted by universities worldwide to facilitate and ease education delivery and help faculty and students deal with anxiety and possible negative effects of the Pandemic (Johnson et al., 2020; Lederman, 2020).

The present study aims to examine the impact of the COVID-19 Pandemic on traditional teaching and learning practices and the opportunities and challenges of switching to an online-centric delivery mode at the Department of Landscape Architecture at Imam Abdulrahman Bin Faisal University, Saudi Arabia. The authors conducted a questionnaire survey and focus group discussions with students and reported a case study of how they adjusted course delivery plans, such as reformatting the remaining lectures, reducing course load, and modifying assessment criteria. This study shares experiential online teaching and learning from the perspectives of both students and instructors of a theory course after the transition from the traditional to the online mode of teaching and learning. Both students and instructors faced considerable obstacles and had to adapt to the new modalities accordingly. Therefore, the questions this study explores are:

1. How did the students perceive the sudden shift from face-to-face to the online mode of learning?
2. What were the common obstacles faced by the students and teachers alike during the online teaching and learning phase?
3. How can instructors improve the student experiences during the online learning phase?

In Saudi Arabia, few studies reported the experience of university students and faculty during the sudden transition to online education caused by the Pandemic. For example, Almaghaslah and Alsayari (2020) studied the impacts of the Pandemic on teaching, research, and administrative duties among the academic staff of the College of Pharmacy at King Khalid University using an online questionnaire survey. The respondents reported that the transition to online education and the related administrative work was carried out smoothly, but research activities were negatively affected. Nevertheless, the study did not include students who are important stakeholders in teaching and learning. On the other hand, Khalil et al. (2020) conducted a qualitative study to assess the perspectives of Qassim University medical students about the sudden transition to online education during the Pandemic and noted that the participants well-received online classes. However, their study neglected the perspectives of academic staff regarding the prospects and challenges of online learning. Similarly, medical and pharmacy students have different learning environments than landscape architecture students, indicating the need also to explore the experience of the latter. Also, the present study utilized mixed

methods to benefit from the strength of both questionnaire survey and focus group discussion (FGD).

The experiential learning of a rapid adaptation to online course delivery reported in the present study can guide faculty members in other universities to learn lessons or validate their findings from the course adaptations they made during the Pandemic. Furthermore, the study may give some positive insights about future academic planning considerations in case the Pandemic forces longer university closures or if a similar situation arises in the future. The next section details the adaptation measures for transition to online course delivery at the Department of Landscape Architecture of the University. Next is Section "Materials and Methods" that describes the research design. Section "Results and Discussions" presents and discusses the study findings, while the last section concludes the paper with some remarks and recommendations.

ADAPTATIONS TO ONLINE TEACHING IN THE LANDSCAPE ARCHITECTURE PROGRAM

In the following days, after the first case of COVID-19 was reported in the country, all faculty and staff were physically coming to the University for regular office hours. However, as the number of new cases increased, the University management directed all faculty members to transit to remote work completely. Thus, the semester was almost halfway through, with substantial course content yet to be covered at that time. All university courses are offered in a 15-week semester followed by a final examination.

The Theoretical courses in the Program are lecture-based, delivered face-to-face using tools such as whiteboard and multimedia. Class meetings are scheduled weekly, and the students are supposed to be involved in class discussions (individual and group) which also account for their final grade. Furthermore, they also watch two documentary films related to the course objectives and summarize them based on a standard procedure developed by the instructors. Other course assessments typically include at-least two individual report writing assignments and one end-of-the-term group project. The students are only required to conduct site visits for the group project.

Additionally, the students must take two written quizzes and one mid-term examination based on the lectures and assignments related to the course. The course concludes with a written examination that has the highest weightage in terms of the grades assigned. The course learning outcomes are based on the learning domains - knowledge, skills, and competencies - approved by the National Center for Academic Accreditation and Evaluation.

Modes of Communication Between Students and Instructors

The course instructors were available for consultations and student support during office hours, at least 2 h a week. Students were notified about the office hours of all instructors, along

with their email addresses. A student who cannot meet an instructor during their designated office hours may request another convenient time. At least one instructor's contact number is also shared with the students for communicating *via* text messages, WhatsApp, or audio calls in case of urgency.

The e-learning Management System of the University uses Blackboard as the mainstream platform for providing a wide range of services to the students and instructors, including course guides, lessons, updates, assessments, grades, tools. In addition, the Students Information System (SIS) is used to record students' attendance, grades, and class schedules. Due to a growing emphasis on e-learning technologies, the University and its associated deanships have provided extensive training and workshops to enhance students' and instructors' involvement in the e-learning systems. Even before the Pandemic, instructors have frequently used these systems to share course content with the students. However, it is worth mentioning that instructors were mostly using the Blackboard for announcements, sharing lecture resources such as PDFs or PowerPoint slides, and posting students' grades. Similarly, students were typically using the Blackboard platform to access information provided by the instructors and submit assignments. Other advanced features of the Blackboard, such as online quizzes or exams and audio/video lectures, were less frequented by the course instructors and students mainly because of inconvenience, time consumption, and lack of experience.

Adaptations Made by the Course Instructors

The course instructors attended two of the many training sessions offered by the University on the use of QuestionMark. They learned how to create quizzes and exam questions and link them to course learning outcomes, set up the date and time for the quiz/test to be available to the students, access and grade the completed quiz or exams, and assign and publish grades on the *Blackboard*. The course instructors also attended one workshop on using the Zoom application and its various features and settings for delivering online lectures and coordinating and recording discussions with the students. The literature indicates that providing faculty with the required training can enhance their satisfaction and technical and pedagogical skills (Stickney et al., 2019).

The most important step after the closure of the University was to revisit the remaining lectures and assessment tasks and decide whether they require any modifications because of the change from traditional to online mode. **Figure 1** below summarizes the major modifications made before resuming the course delivery after the suspension of face-to-face classes.

Reformatting the Remaining Lectures

Initial discussions among the instructors indicated that the students tended to be less involved and focused on online lectures due to the lengthy online meetings. Therefore, the PowerPoint lectures were slightly modified by either deleting additional text or making the most important words, phrases, or definitions bold

FIGURE 1 | Steps involved before resuming online classes.
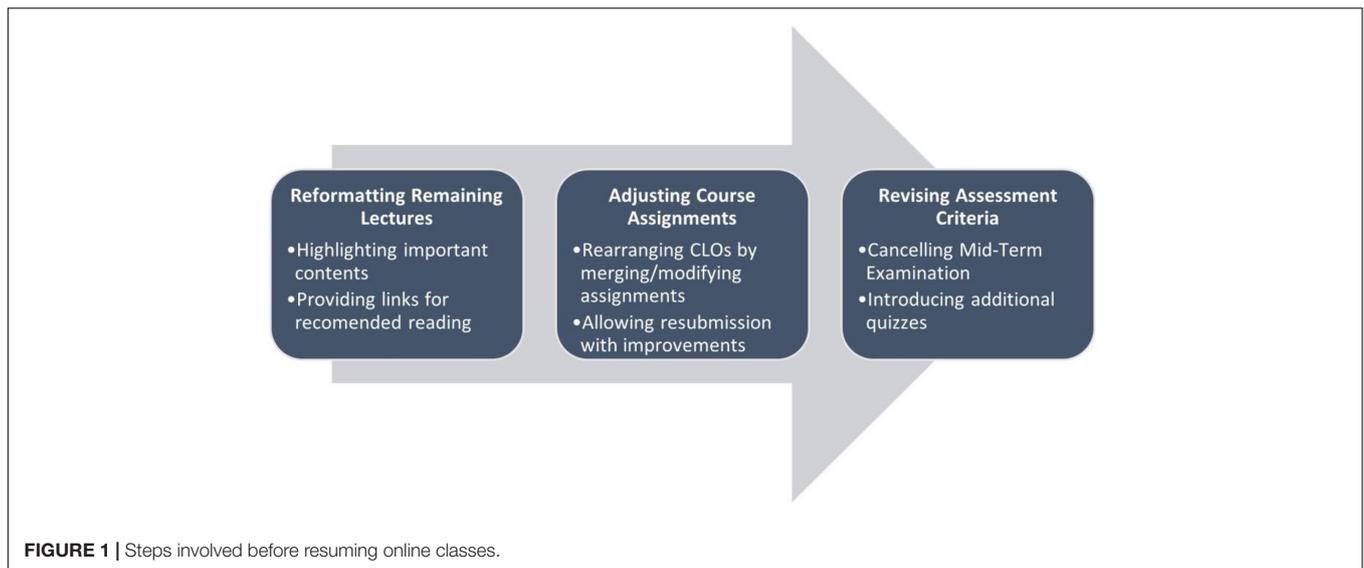
or highlighted to help the students understand the contents more easily. However, the students were still given either the extended versions of the lectures for reading at home or a detailed list for 'recommended reading' along with hyperlinked sources available through the University's digital library.

Adjusting Assessment Criteria and Requirements

During the transition period, the students have already submitted some of their assignments. However, regarding group assignments, the Department decided to merge their course learning outcomes with other remaining assessments because the students could not make site visits due to the lockdown situation. In place of conventional mid-term examination where students appear physically in the exam hall, the instructors revised the assessment by carefully merging grading weightage according to the course learning outcomes. For example, the mid-term and final examinations grades were combined into additional quizzes and individual assignments. This modification shown in **Figure 1** ensures that the course learning outcomes and student performance are measured effectively.

The instructors canceled the mid-term examination and introduced three more quizzes instead of only two planned quizzes at appropriate intervals to replace the final exam. Due to the circumstances, the instructors revised the assessment criteria by carefully merging and shuffling grading weightage according to the course learning outcomes. For example, the mid-term and final examinations grades were combined into additional quizzes and individual assignments. This adjustment was necessary because otherwise, the course learning outcomes and student performance would have been affected considerably.

Enhancing Modes of Communication

To minimize the disruptions caused by the sudden transition to online learning, each course instructor offered two extra office

hours a week for one-on-one online consultations with students to address any problems they encountered. Each instructor also maintained several hours responding to student inquiries *via* emails. Instructors also shared their phone numbers with the students for communicating *via* text messages, WhatsApp, or audio calls in case of urgency. In addition, the instructors increasingly used SIS and Blackboard e-learning platforms to record students' attendance and grades, publish instruction materials and assignments, and interact with students.

Collecting Regular Feedback From Students

The instructors electronically sent out online snapshot feedbacks in the form of open text comments to each student at the end of each lecture session to collect feedback about students learning outcomes. Additionally, feedbacks on the challenges related to online education were encouraged from the students during the FGD sessions. The discussions were replayed at the end of the sessions, and key issues were transcribed and synthesized. The outcome from the process informs a part of the result section of the present study.

MATERIALS AND METHODS

This research adopted a mixed-method approach comprising an online questionnaire survey and FGD to examine the impact of COVID-19 Pandemic on course delivery after the sudden transition from a traditional, face-to-face teaching and learning practice to online education. The study also assesses the opportunities and challenges encountered during the transition, focusing on the course delivery modes, methods of assessment and examinations used by the course instructors, the extent of students' satisfaction with the course delivery, and the effectiveness of the teaching and learning processes during the initial phase of online education. While the questionnaire survey depended upon the

experiences of all students of the Department of Landscape Architecture, the FGD approach was meant to assess students' satisfaction in an individual course taught by the researchers during the Pandemic. Indeed, FGD can assess students' experiences of particular teaching and assessment methods (Breen, 2006).

The structured questionnaire was adapted from a previous study (Almaghaslah and Alsayari, 2020) and hosted online. The researchers emailed the link to the survey to all 45 students enrolled in the Bachelor of Landscape Architecture Program at the study time. The questionnaire was structured around the participants' demographic characteristics, experiences, perceptions about online lecture sessions, assessments, ICT, ability to interact with the e-learning platform, and participation in class discussions. Survey responses were recorded using the Likert Scale (1-5) satisfaction level: never, rarely, sometimes, often, and always. Out of 45 enrolled students, 33 students (73%) completed the survey. The data were analyzed using descriptive statistics: percentage, mean, standard deviation (SD), and the Relative Importance Index (RII).

The FGD was held using the *Zoom* application and lasted for about 50 min. Sixteen out of the 20 enrolled students participated in the discussion sessions, divided into two groups for easier management. The sessions began by briefing the participants about the purpose and importance of the study, the type of questions to be asked, and how they could interact. Next, the course coordinator facilitated the discussion and allocated speaking time to each participant. Then the floor was opened for discussion, comments, and questions and answers. Both sessions were recorded, transcribed, and analyzed using thematic content analysis in which themes from the discussions were generated, organized, and synthesized.

Moreover, this study's authors, the course instructors, have utilized a single descriptive case study methodology to explain their own experiences before, during, and after shifting to online teaching and learning modes. The approaches used for collecting the case study data include in-class (online) discussions, instructors' observations, instructors' daily activity log, feedback through emails, WhatsApp and text messages, phone calls, and notes from the class representative. A study comprising multiple data sources has higher content validity because of triangulation: converging lines of inquiries.

A reliability test using Cronbach alpha was performed on the research variables to test whether the participants' responses to each research question were valid. The test results in **Table 1** indicate a fair coefficient of 0.529 for participants' ability to interact with peers using the e-learning platform. The rest of the variables have satisfactory reliability, with coefficients ranging from 0.797 to 0.907.

RESULTS AND DISCUSSION

Results From the Questionnaire Survey

The survey respondents were drawn from year three to five undergraduate students ($n = 33$) where 42.4% of those that completed the survey were students in their final year (year 5)

TABLE 1 | Reliability test of the questionnaire items.

Research variable	No. of items	Cronbach's α
Ease of technology use	5	0.871
Engagement with online assessment	5	0.812
Degree of concentration during e-learning	5	0.797
Engagement with instructor and peers	12	0.907
Willingness to engage in group and one-to-one discussions with instructors	5	0.853
Ability to interact with peers using e-learning platform	5	0.529

$\alpha \geq 0.9$ = excellent; $0.7 \leq \alpha < 0.9$ = Good; $0.6 \leq \alpha < 0.7$ = acceptable; $0.5 \leq \alpha < 0.6$ = fair; $\alpha < 0.5$ = unacceptable.

of the study, 39.4% were from year 4 (4th year), while 18.2% were studying in year 3 (3rd year).

(a) Students' experiences with online course delivery and assessments

Table 2 presents the students' experience and engagement with online learning using percentages, averages, SD, and relative importance index (RII). There seem to be different levels of challenges and disruptions experienced by the participants. The difficulty of concentrating during classes is the highest-ranked challenge faced by students (RII = 5.34), followed by concentration during lectures with a similar RII of 0.528. In contrast, the least challenge is the internet connection problems (RII = 0.472). While 30.3% of respondents reported always experiencing technical communication problems, 6.1% said they always experienced the challenge. About 12.1% indicated they always face difficulty concentrating on the lecture contents, 24.2% stated they never experienced such a problem. In another question around student ability to keep pace with lecture delivery, 33.3% of respondents sometimes and 15.2% of them often find online lectures a bit fast. Hence, they are unable to keep up with the delivery.

Students were also asked to gauge their level of engagement with varied forms of assessment used to measure their learning outcomes. **Table 3** indicates that the most important challenge to the students is feeling of overburden by excessive assignments (RII = 0.63), followed by understanding assignments requirements (RII = 0. 57) and completing assignments online (RII = 0.53). On the other hand, the least important challenge is the inability to access assignments online (RII = 0.442). Based on the number of questions asked, 27.3% of the participants said they sometimes have difficulty organizing themselves to prepare for online quizzes/exams at home. While 42.4% of the respondents sometimes experienced difficulties understanding assessment requirements, more than half of the respondents never or rarely faced challenges of understanding or completing online quizzes/exams. Similarly, 66.7% of the participants affirmed that they never or rarely experience difficulties submitting their assessments to Blackboard (**Table 3**).

(b) Students' satisfaction with the instructors' performance on online teaching

Table 4 shows the percentage, mean, standard deviation, and RII for each factor considered in this section of the

TABLE 2 | Students' experience with online lecture delivery.

Variables	Percentage (%)					Mean	SD	RII
	Never	Rarely	Sometimes	Often	Always			
Technical problems connecting to e-learning medium for lecture (zoom)	18.2	33.3	36.4	9.1	3.0	2.45	1.003	0.490
Difficulty concentrating during lectures	24.2	24.2	24.2	15.2	12.1	2.67	1.339	0.534
Difficulty understanding the lecture content or concept	27.3	15.2	27.3	27.3	3.0	2.64	1.245	0.528
Difficulty keeping up with lecture pace	18.2	27.3	33.3	15.2	6.1	2.64	1.141	0.528
Experienced technical problems communicating with instructors during live sessions	30.3	12.1	30.3	21.2	6.1	2.36	1.245	0.472

TABLE 3 | Students' experiences with online assignments and assessments.

Factors	Percentage (%)					Mean	SD	RII
	Never	Rarely	Sometimes	Often	Always			
Difficulty in preparing for online quizzes/exams at home	30.3	27.3	27.3	6.1	9.1	2.36	1.245	0.472
Inability to access online quizzes/exams links	24.2	36.4	33.3	6.1	0	2.21	0.893	0.442
Difficulty in concentrating during online quizzes/exams	30.3	36.4	18.2	9.1	6.1	2.24	1.173	0.448
Difficulty in understanding online quizzes/exams	21.2	33.3	27.3	12.1	6.1	2.48	1.149	0.496
Experienced problem completing online quizzes/exams within the given time	24.2	27.3	18.2	21.2	9.1	2.64	1.319	0.528
Problem arranging for facilities and devices required to complete assignment (internet/computer/laptop/printer)	30.3	18.2	24.2	24.2	3.0	2.52	1.253	0.504
Difficulty in concentrating or completing assignments while working from home	27.3	18.2	36.4	15.2	3.0	2.48	1.149	0.496
Understanding the requirement for the assignments and assessment	21.2	6.1	42.4	27.3	3.0	2.85	1.149	0.570
Feeling overburdened due to the excess of other course assignments	9.1	21.2	39.4	6.1	24.2	3.15	1.278	0.630
Difficulty in submitting assignments on to Blackboard	30.3	36.4	18.2	9.1	6.1	2.24	1.173	0.448

survey. Overall, there is the highest level of satisfaction with the instructor's engagement with students in discussions (RII = 0.716), encouraging students to ask questions and support to minimize difficulties (RII = 0.716). Conversely, adjustments and modifications of assignments received the least satisfaction level from the students. About 51.5% of the respondents are very or extremely satisfied with how the instructors encouraged them to ask questions, seek clarifications, and engage in discussions during online lectures. However, 33.4% were not satisfied or slightly satisfied with opportunities to resubmit assignments with improvements. Another 27.7% were not satisfied or slightly satisfied with timely feedback on their studies and assessments by instructors.

(c) Students' participation in online learning

Figure 2 presents the results on participants' attitude to engage with interactive functions of the live e-learning session. This study finds a varying degree of satisfaction for each question asked. For example, about 36.4% of the respondents see the platform as extremely satisfying for answering questions by the instructors. In addition, engaging in verbal discussions was also considered extremely satisfactory (27.3%) among the participants. In comparison, 24.2% said they were not satisfied using the live video chat to get the attention of the instructor and peers during the online session, and

another 21.2% indicated dissatisfaction with the platform for written communications.

Figure 3 presents students' assessment of the importance of various forms of interactions with other students and instructors using the online learning platform. Close to one-third of the respondents (30.3%) considered the medium extremely important for working in group assignments. Using the platform for working individually or obtaining additional details for assignments are interactions deemed very important by 27.3% of the respondents. However, 24.2% of them considered the medium slightly important for working on assignments individually.

(d) Students' preference for different modes of communication

Figure 4 reveals that, overall, participants expressed a greater (27%) preference for WhatsApp messaging, followed by email correspondence (22%) and Blackboard announcements (10%). The discussion forum is their least preferred mode of communication. This result is not surprising given the country's high rate of internet penetration and the use of social media (Almulhim and Abubakar, 2021).

Results From Focus Group Discussion

The findings of the FGD were categorized into the resulting five themes discussed below. Quotations of students' expressions

TABLE 4 | Students' opinions about instructors' performance on online teaching.

Factors	Percentage (%)					Mean	SD	RII
	Not satisfied	**Slightly satisfied**	**Moderately satisfied**	**Very satisfied**	**Extremely satisfied**			
Explanations given by instructors about new adaptations for the courses	9.1	15.2	39.4	33.3	3.0	3.06	0.998	0.612
Modes of communication used for announcement and updates	0	15.2	39.4	33.3	12.1	3.42	0.902	0.684
Adjustments and modifications in the types of assignment accordingly	9.1	21.2	36.4	27.3	6.1	3.00	1.061	0.600
Adjustments and modifications in the types of assessment (quizzes/exams) accordingly	9.1	15.2	30.3	36.4	9.1	3.21	1.111	0.642
Providing flexibility in assignment deadlines	12.1	9.1	27.3	30.3	21.2	3.39	1.273	0.678
Providing opportunities to resubmit assignments with improvements	15.2	18.2	21.2	36.4	9.1	3.06	1.248	0.612
Providing timely feedback on assignments and assessments	18.2	9.1	27.3	24.2	21.2	3.21	1.386	0.642
Availability of instructors to discuss any difficulties or problems faced	6.1	12.1	39.4	21.2	21.2	3.39	1.144	0.678
Accommodation and support to students against any difficulties or problems faced	0	15.2	33.3	36.4	15.2	3.52	0.939	0.704
Encouraging students to ask questions and seek clarifications during or at the end of each online lecture	6.1	12.1	30.3	27.3	24.2	3.52	1.176	0.704
Encouraging students to engage in discussions during or after the lectures	0	15.2	33.3	30.3	21.2	3.58	1.001	0.716
Concluding the course according to the course learning outcomes	12.2	15.2	33.3	24.2	15.2	3.15	1.228	0.630

exemplify the common themes originating from the discussion sessions. The results are then discussed within the context of the existing body of knowledge.

(a) Difficulty in concentrating during lectures

Students frequently complained about not being able to focus on the online lectures and the difficulty in concentrating. Losing attention during online classes is often because of distractions from other activities, such as chatting with friends and surfing the web, happening simultaneously (Govindarajan and Srivastava, 2020). As a result, students often found the online sessions not engaging and 'boring' and struggled to remain focused throughout the lectures. One student stated, "*I could not focus on the lectures…there was (frequent) noise in the background.*" Another source of lack of interest during lectures is having "*too much information and text.*" Distractions by family members at home also contribute to loss of focus and difficulty concentrating on online education.

Regarding the difficulty in concentrating during online lectures, students frequently mentioned not being able to focus or concentrate. This notion corroborates Ogunleye's (2010) study that concluded that online education might have little to offer to arouse students' interest. Similar findings were also reported by Mukhtar et al. (2020), who found that students considered limited attention span a disadvantage of online education. Moreover, technical issues, weak connections, and delays in starting the online classes may further cause discontentment and frustration among online learners (Mackey and Freyberg, 2010).

(b) Internet connectivity and technical issues

Poor signals from the telecommunication network and slow internet connection are some technical issues that undermine the transition to online education. A few students said they frequently experienced problems accessing the links to the QuestionMark exams because of slow or broken connectivity during online learning. For example, one of the students had a technical issue and reported: "*My link did not work. I tried from the phone and also from the laptop, but it did not work*" (referring to QuestionMark Quiz, the issue was resolved later). Another student had a connectivity issue because he lived in a remote area. In addition, the group faced occasional problems with assignment submissions through the Blackboard, mostly because of low internet bandwidth or connectivity issues. For example, a student who tried resubmitting an improved assignment remarked, "*the system is not allowing me to resubmit the assignment,*" to which the technical problems persisted even after the instructors deleted the earlier submission and allowed for resubmission and had to accept email submissions instead.

This issue of interrupted Internet connectivity and software technical issues is consistent with that of the study by Almulhim et al. (2020), who found that problems with the Internet connection were a major source of discontentment among medical students in Saudi Arabia. Thus, the high demand for internet services during online learning is a likely contributor to technical problems encountered.

(c) Increased workload

As a result of a sudden transition to the online mode of learning, there was a common feeling among the students of being
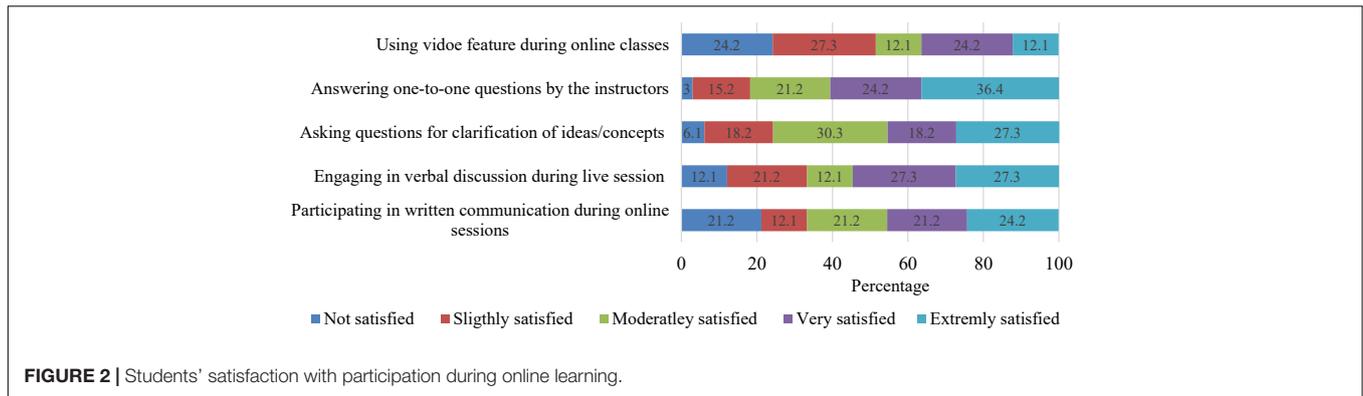
FIGURE 2 | Students' satisfaction with participation during online learning.
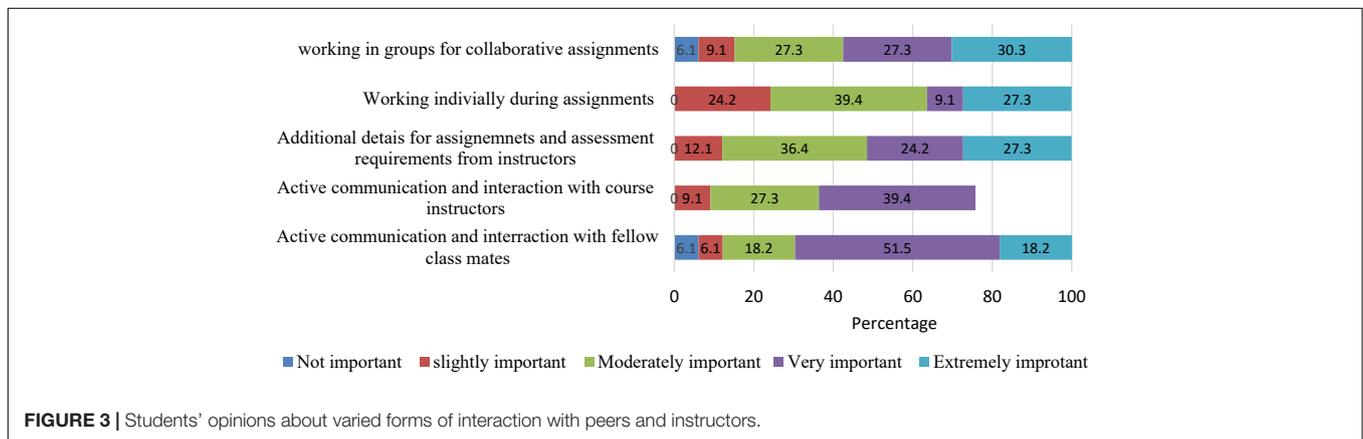
FIGURE 3 | Students' opinions about varied forms of interaction with peers and instructors.

overburdened with several tasks from other courses. They also indicated finding it very difficult to handle all the assigned tasks simultaneously. For example, one student complained that: "*too many instructors are giving us work, and I find it not easy (to handle)*." This concern by the students about increased workload has also been reported in earlier studies. For example, Roby et al. (2013) reported that surveyed students mentioned more workload as one of the disadvantages of online education in their

FIGURE 4 | Students' preference of different modes of communication.

studies. However, in this case, it could just be a misconstrued perception by the students as instructors in the department confirmed that the course requirements were rather lowered instead of increased.

(d) Difficulty with quiz/exam formats

Another issue brought up by the students in the FGD was the lack of familiarity with the QuestionMark format and how to engage with an online quiz as they found it difficult to navigate through the platform. For instance, one student said he had trouble understanding the task format and said, "*It was difficult for me to attempt the quiz, even though I prepared very well for it.*" Another student remarked, "*I did not know how many total questions I have to attempt. . . I will prefer to solve (the quiz) with my sequence.*" Whereas one student said, he did not expect the kind of question he got in the quiz. "*I was not prepared for the last question*" (referring to a descriptive question).

In addition, several students mentioned that the time for completing online quizzes was not enough compared to paper-based quizzes before the online transition. "*The time given for the quizzes was very less than before.*" Besides, there was a feeling among the group that "*the questions should be easy,*" implying that they should either be based on multiple-choice questions (MCQ) only or the number of MCQ should be more than descriptive and analytical questions. However, students were more interested in MCQ or definitions than in descriptive and analytical questions during online quizzes and exams. This finding is consistent with the study conducted by Toufaily et al. (2018), where the students

mentioned not being able to sit in front of the computer for too long as a disadvantage of online education.

(e) The need for recorded lectures

Another observation raised by the group was the lack of recorded lecture sessions for later use. The participants suggested recording and giving them the lectures at the end of classes instead of PDF versions. One student said: *"I want to be able to go back to the lecture and watch it again. . .not through simple (PDF) lecture."* Also, some participants suggest that a shortened lecture session will be much easier to engage with, as summed up in the words of one of them: *"It is not possible for us to sit for 2 h in online mode. Time for lecture should be short."*

Instructors' Experiences of Online Course Delivery

The findings reported in this section are brief accounts of instructors' experiences of online course delivery during the Pandemic. The accounts are based on their observations, activity logs, and individual feedback received from students. The experiences are organized around online lecture delivery, assignments and grading, communicating with students, and technical issues.

(a) Online lecture delivery

For the first few lectures, the class timings were not followed as scheduled to allow the students some time to adjust to the new learning modalities. Therefore, the initial lectures were scheduled after discussing with the students about the best possible time that suits all of them (see **Box 1** for example). The literature indicated that the first online teaching experience could be challenging for instructors and students because of likely confusion and ambiguity for those without prior experience (Schmidt et al., 2013). Since it was the first time the instructors delivered a course online, many new experiences and observations were made. Some were positive, and some were not very promising.

The instructors observed that most students lose interest in the lecture after the first 30 min and stop giving proper attention in the remaining lecture duration. This issue persisted throughout the course delivery, even with modifications to the lectures and shortening the duration. After some deliberation, the course instructors introduced more interactive ways, such as watching online short movies related to the course outline (see **Box 2**). Another strategy is asking students to fill in pre-designed templates to summarize their understanding of the topics discussed. This strategy proved effective as the students showed much interest, and submissions were made within the time limits set out for them.

BOX 1 | Flexible lecture hours to allow students to adjust to the online mode of learning.

BOX 2 | Alternative teaching strategies to improve students' concentration.

BOX 3 | Announcement about resubmitting the assignments after technical issues were reported.

Taking attendance is another challenge faced by instructors during online lectures. The process consumes time and students feel bored. Likewise, tracking who was present is difficult and distracts the instructors from class delivery as they cannot do both simultaneously. Furthermore, some students were not interested in asking questions even when individually prompted during or after the lectures. They rather wanted the instructors to quickly end the online session in order to leave as soon as possible. As such, instructors tried to ask random questions to increase students' attention. Nevertheless, even when called out by names, several students could not respond to the questions, implying they either physically left the session while still logged in or had technical issues. This issue is particularly concerning since some students always distract themselves from the learning atmosphere. However, the instructors did not press this issue beyond a considerable limit due to the special circumstances involved. Many students were genuinely going through difficult times and were facing countless challenges to learn online. A similar experience of inactive students' participation in an online course during the Pandemic was reported in Hong Kong (Moorhouse, 2020). While sharing community college instructors' experiences in online learning, Hulett (2018) notes that having higher motivation is a crucial factor in affirming students' success.

(b) Course assignments and workload

The students indicated some problems that prohibited them from submitting the assignments online during the first few days. One possible explanation for this is the excessive internet and e-learning system usage and accessibility issues about weak internet access. However, the concerned IT personnel solved most of these issues, and the instructors allowed resubmissions to all students (see **Box 3**).

Grading the assignments was another challenge faced by the instructors. They always use the approved grading rubrics, compare the quality of work among other students, and peer-review their assessments to ensure fairness. Also, grading is easier

BOX 4 | Announcement for resubmitting assignments after improvement.

Article Review Submission & Improvement ⊘

Posted on: Friday, March 27, 2020 10:33:30 PM AST

Dear Students,

Please note that in order to give a chance for improvement, we have decided to allow resubmission for Article Review One & Two Assignments.

For this, we have created separate folders in BLACKBOARD under ASSESSMENTS. Kindly make sure to upload your submissions for Article Review One & Two in these two folders.

Even if you DO NOT want to improve, you still have to submit the old/original submission into the folder. It has become really difficult for us to sort out the assignments through emails and therefore, we will not accept any submission through emails.

The deadline for the resubmission is April 02, 2020 by 11:59 p.m. The folder will be hidden after this deadline.

BOX 5 | Instructions about the course of action in case of technical difficulties during online quizzes/exams.

Quiz Timings and Instructions (Thursday, April 02, 2020) ⊘

Posted on: Tuesday, March 31, 2020 10:57:46 PM AST

Dear Students,

Kindly follow these instructions to access the Quiz for **Thursday, April 02, 2020**:

1. Log-in to your Student Dashboard and Click on Contemporary Issues in LA
2. From the options given on the left-hand side (English Language) or the right-hand side (Arabic Language), choose '**Quizzes**' folder.
3. Under the Quizzes Folder, you will find a link: Quiz Thursday, April 02, 2020
4. This link will be visible from **09:00 AM** until 09:30 AM.
5. Once started, you will have a LIMITED TIME to finish the Quiz.
6. Please note, there is ONLY ONE ATTEMPT allowed for the Quiz.

BOX 6 | Announcing online quiz timings and instructions.

Instructions for Quiz Four (April 16, 2020) ⊘

Posted on: Wednesday, April 15, 2020 10:04:44 PM AST

Dear Students,

- Kindly note that you will find the Question Mark link for the Quiz Four in the QUIZZES folder inside the Contemporary Issues in LA on the Blackboard.
- The link will be visible exactly at 9:00 a.m. and will not be visible after 9:30 a.m. If you try to access it too late, you might not be allowed to take the quiz by the system or even if you do, you won't be able to finish it in the time limit set automatically for the Quiz.
- Please also take into account that once you start the Quiz, you will have only 30 minutes to finish it.
- Some questions may be included from the video links provided in the lecture, you are advised to go through the links before the Quiz. YOU MAY still watch these links during the Quiz to refresh your memory BUT please note that you will NOT GET EXTRA TIME to watch the videos, the Quiz still needs to be finished within 30 minutes.
- Also note that if any student's answers are found to be matching with other students, all the students involved in copying might get a deduction in the points assigned for the concerned question(s).
- Therefore, write the answers in your own words and do not share your answers with other students.
- Kindly access the Quiz only through Blackboard and DO NOT click on any links forwarded to you by other students.

BOX 7 | Added details and instructions for online quizzes/examinations.

Announcement regarding Article Review Submission ⊘

Posted on: Wednesday, March 11, 2020 1:16:53 AM AST

Dear Students,

Please note that a folder has been created on the Blackboard for the submission of the **Article Review on Green Infrastructure** that was introduced to you last week.

The deadline for the submission is March 12, 202 by 11:59 p.m.

Please follow the deadline and **IF** you face any difficulty in uploading the article on the blackboard, then email it on ▭

Note: As per the latest directive from the university authorities, the suspension of classes is ONLY for the regular classes and students are not supposed to be physically present at the University. However, ONLINE CLASSES will still be taking place and attendance through the online platforms is also mandatory. For the latest updates, please check your university email accounts regularly.

and faster in paper-based assessments as the instructors could shuffle the pages to revisit other questions than *via* the *Blackboard* easily. Nonetheless, the instructors found that reconciling grades is best done through *Zoom* meetings, although it required considerable time.

Another challenge was receiving and managing assignments through emails. After some time, it became quite difficult to differentiate between subsequent and current assignments, and some files were even corrupted. Therefore, the instructors changed the medium of submissions to online, gave detailed written feedback, and allowed resubmissions to improve their performance (see **Box 4**). However, despite the opportunity, very few students improved their assignments.

(c) Online quizzes and examinations

The students were also given details about the online quizzes and links for related lectures, similar to assignment instructions. The instructors realized the need to inform students beforehand about what to do in case of technical difficulties during online quizzes/examinations. Furthermore, due to anticipated technical issues in the remaining quizzes/exams, the students were informed about the proper course of action in case of any technical problems (see **Box 5**). In addition to guidelines for facing any technical difficulties, the instructors also sent instructions about the timing, duration, and related details through announcements and emails (see **Box 6**). Also, the same detailed information was sent to the students in the *WhatsApp* group through the class representative.

However, some issues persisted, such as students forwarding inaccessible links to other students, which did not work as each student must access the online assessment links through his account on the *Blackboard* and not through forwarded links. Moreover, it was found that having the whole quiz as MCQ is not a good idea since it increases the chances of cheating, and there is no way of making sure it does not happen in an online quiz or exam. The instructors found considerable evidence that some students had copied the exact answers from one another.

Therefore, the students were informed that the subsequent quizzes would contain analytic or descriptive questions in addition to MCQ. Moreover, the instructors resorted to more detailed instructions, and the students were also repeatedly advised not to access online assessments through forwarded links (see **Box 7**).

Making, publishing, and marking quizzes *via* the *QuestionMark* platform consumed more than three times the time for conventional paper-based assessment. This process can be particularly challenging because of the need to reconcile grades to avoid any bias or mistakes. The Pandemic has also increased the workload for teachers who had to rapidly transform courses and assessments designed for face-to-face to online education. For instructors, it means spending more time in logistics than improving the quality of teaching and learning (Dumford and Miller, 2018).

(d) Communication and feedback

Upon the suspension of face-to-face classes, the students were advised to check their emails for official announcements related to the course. The students were not interested in having a video call and always had their cameras off. Likewise, most students had their mics muted as well. This part was particularly peculiar for the instructors as there was no way of finding out how well the students were receiving the information. Despite multiple reassurances to contact the instructors, the students still seemed reluctant to contact the instructors to discuss any problems or issues related to the course. A similar concept has previously been mentioned by Serwatka (2002) that the students might show reluctance in asking for help if they face problems in online courses.

The feedback on assignments is crucial for students and helps them 'validate' their work (Serwatka, 2002). Before COVID-19, the course instructors gave face-to-face feedback to the students,

allowing them time to read the comments first and then come to the instructors for any additional explanations. However, during the online phase, the instructors had to give written feedback against the individual submissions on the Blackboard. Therefore, it was largely undetermined whether the students seriously considered this feedback or not. The students were routinely reminded to contact any instructors through emails, WhatsApp, or even phone calls when necessary.

(e) Technical issues

Technical issues are fewer among the instructors than students, therefore, affected their learning activities, online assessments, and assignment submission processes. Due to the overburdened learning systems, which were not ready for such situations, the students frequently complained about not being able to access the Blackboard or, in other cases, unable to submit assignments properly. The instructors believe that this is one of the reasons why the students were dissatisfied and less motivated with the online experience.

Table 5 below summarizes the challenges faced by both students and instructors during the transition to online teaching and learning. The students experienced most difficulties related to low motivation, disruptive home working environment, and technical issues. These challenges are likely because students are overwhelmed by circumstances warranted by the lockdowns. For instance, students that mostly lived on campus within the academic setting (hostels, libraries, classrooms, etc.) before the Pandemic but were sharing their living spaces and learning resources with family members during the lockdowns. As such, concentrating on academic endeavors can be challenging due to distractions, an unsuitable learning environment, and depression due to rising COVID-19 mortality and morbidity cases.

On the other hand, the instructors were challenged by managing students' participation in online course delivery, technical issues, and creating, posting, and grading quizzes and examinations. The instructors strongly felt a lack of motivation and positive spirit among the students, which indicates that the students were largely dissatisfied with the online experience in the initial phase. These experiences have important implications for improving online course delivery in universities. The next section concludes with the lessons learned from the present study and recommends some practices toward fostering online education.

CONCLUSION AND RECOMMENDATIONS

The COVID-19 Pandemic has caused several changes in teaching and learning, negatively impacting educational institutions' stakeholders, including students, faculty, and administrators. Faculty members and students worldwide faced difficulties in shifting to online education during the Pandemic. This study researched the challenges regarding the sudden transition from face-to-face to the an online mode of instruction and shared the experiences of students and instructors of a University in Saudi Arabia regarding the modifications to adaptations that ensued. The University made and supported timely adaptations by procuring relevant education software and programs like Zoom and QuestionMark and conducting extensive training workshops for all the faculty members to help them adapt to the sudden shift to the online mode of instruction. These training sessions have enhanced the instructors' pedagogical and technical skills.

The students most experienced difficulties were low motivation, disruptive home working environment, and ICT issues. Conversely, the instructors faced challenges of maintaining students' participation in online teaching, assessing students through quizzes and examinations, and technical issues. The present study also described how the instructors took various adaptation measures in the existing pedagogical framework to transition to online learning. The current research was limited to a sample of 33 students and three instructors from the College of Architecture and Planning and might not be generalized to other disciplines. However, the experiential learning experience shared in the present study makes several noteworthy contributions that can guide some faculty members to validate their findings from the course adaptations they made during the Pandemic. Furthermore, the study may give some positive insights about future planning considerations in case the Pandemic forces longer university closures or if a

TABLE 5 | Summary of key challenges identified by the students and instructors.

Categories	Challenges faced by students	Challenges faced by instructors
Online lecture delivery	• Lack of motivation and concentration during lectures • Lack of proper (home) environment for online learning	• Recording attendance • Keeping students concentrated • Completing the lectures in a short time • Knowing if the students understood the lecture contents
Course assignments	• Feeling overburdened due to other coursework • Lack of interest in resubmitting assignments	• Restructuring assignments to keep the course learning outcomes the same. • Reconciling grades between the instructors
Online quizzes/ examinations	• Unfamiliarity with quiz/exam formats • Internet connectivity: slow connectivity and lack of signals • Lack of time for attempting the quiz/exams	• Preparing, publishing, and administering online quizzes/examinations. • Comparing student work and reconciling grades. • Controlling cheating during the quizzes/examinations
Communication and feedback	• Lack of camaraderie among peers • Lack of direct contact for feedback with instructor	• Motivating students to ask questions • Proper registration of feedback
Technical issues	• Internet connectivity and accessibility issues • (Occasional) difficulties in submitting assignments	• Accessing online assessment folders due to overburdened virtual learning systems. • Marking assignments during fluctuating internet accessibility

similar situation arises in the future. The following are the key recommendations of the present study.

Online Lecture Delivery

- Instructors should carefully plan any course adaptations to achieve effective online course delivery during the current transition and future similar cases. They should dedicate adequate time to prepare and adapt to the learning environment to guarantee student-centered learning and a rich learning experience. Lecture duration should be shortened to avoid low interest among students and increase students' satisfaction in online courses (Jackson et al., 2010). In addition, short videos from educational websites or *YouTube* can make lectures more interesting. Instructors could also utilize open-source educational resources to cater to the limited preparation time (Huang et al., 2020).
- If increasing student interaction is difficult, instructors could include bonus grades for active discussions and class participation to motivate students. Short oral quizzes can be introduced at the end of each lecture to give students an incentive to be attentive. Because many students are concerned with a meaningful learning experience (Brocato et al., 2015), they can participate in an active, interactive learning environment (Driscoll et al., 2012).
- Course instructors should develop norms for discussions and synchronous interaction in advance and might use examples and rubrics to explain to the students' (Mayes et al., 2011). Discussion forums are an important part of online learning, and instructors should promote those outside class hours (Hulett, 2018).
- Students should also be prompted to ask questions during or after lectures. They should be mandated to post questions through the chat function, while the instructor answers them during or after classes. Encouraging students to explore more on the topic and giving presentations might also be helpful in this regard (Atreya and Acharya, 2020).

Course Assignments and Workload

- Institutional and faculty supports are important for students to adapt to online learning modalities, especially under lockdown circumstances. Students should also be acquainted with the unique demands of online environments such as increased cognitive discipline, independence, and personal responsibility (Mayes et al., 2011) and intrinsic motivation, maturity, good time management, and active participation in in-class activities (Hulett, 2018).
- Course instructors should consider that students might be overburdened and exhausted due to the workload from other courses. Moreover, the circumstances related to the Pandemic itself have also been reported to increase stress among university students in Saudi Arabia (AlAteeq et al., 2020).
- The instructors could manage initial, pre-submission evaluations and give feedback before grading the

assignments to enhance student performance. This strategy might encourage students to improve the assignments before submitting them for final assessments.
- Wherever possible, the instructors should not impose strict submission deadlines and allow some flexibility to the learners.
- Instructors should devise innovative methods for introducing group work and course learning outcomes that require collaboration and teamwork because during the Pandemic students could not go outside their homes, and face-to-face interaction was hampered.
- One way, for example, could be for the groups to meet separately, following the guidelines and SOPs for safe distancing. If site visits or practical work are not possible, similar activities should be introduced based on the same learning outcomes. Serwatka (2002); Stallings (2002) propose that in online teaching settings, the criteria for assessment should be revised to assess student mastery.

Online Quizzes/Examinations

- Assignments and homework should supplement online assessments that are challenging, especially when courses involve practical skills or technical competencies. These alternative assessment methods should be based on relevant rubrics (Osman, 2020). Students find online exam formats unconventional and difficult since face-to-face education is the mainstream mode of teaching and learning before the Pandemic.
- Students should be familiar with the format and the typology of questions and the time allowed beforehand to prepare adequately. This task could be done by asking students to take mock examinations to become familiar with the format and sharing detailed, step-by-step instructions.
- Although students might prefer the easier way of having only MCQ in quizzes and exams, higher-order, cognitive skills-based questions are also recommended to ensure consistent course learning outcomes.
- To avoid cheating, instructors could make a large question bank and choose options such as shuffling the question sequence and selecting random questions for each student. The same method has previously been endorsed by Serwatka (2002).
- Making online MCQ based on the same cognitive level and course learning outcomes as paper-based quizzes/exams needs extensive revisions. Therefore, instructors should prepare such questions way ahead of the scheduled quiz or exam date or preferably at the beginning of the course.

Communication and Feedback

- The key to effective communication between the students and instructors is finding different avenues to connect with them (e.g., emails, phones, virtual meetings, social media) and removing barriers to communication (Schmidt et al., 2013).

- Introducing online office hours could help students feel free to contact instructors during these hours. This recommendation is important because students might feel hesitant to interrupt the instructors in their private time or decide when to contact them to discuss issues or seek any clarifications on learning (Serwatka, 2002).
- Students should be given immediate and constructive feedback on course tasks and discussions (Mayes et al., 2011). However, as reconciling grades and comparing the student work could be time-consuming, instructors should allow sufficient time between assignment deadlines and assessment schedules to avoid overburdening themselves and providing prompt feedback to the students.
- Future online courses should include a student-instructor 'camaraderie' (friendship), through avenues such as 'coffee shop' or 'teacher's lounge' to promote interaction, support students and develop trust (Mayes et al., 2011).

Technical Issues

Educational institutions should provide students and instructors with prompt ICT support whenever needed. Technical support facilitates online education and teachers' responsibilities (Roby et al., 2013). Having technical issues related to the e-learning system could impede students' progress and their perceptions of its usefulness (Almaiah et al., 2020), exacerbate inequality in online education and intensify the digital divide among students (Govindarajan and Srivastava, 2020). Instructors in online environments need to put more effort into helping students resolve technical issues, especially under the circumstances such as the current Pandemic.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

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Coming to Terms With COVID-19 Reality in the Context of Africa's Higher Education: Challenges, Insights, and Prospects

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This perspective paper aimed at elucidating the effects of the COVID-19 pandemic on African institutions of higher education. With specific reference to Kenya, the paper exposed the state of the country's unpreparedness in terms of instructional technologies, a situation that had contributed to an almost total shutdown of institutions following the outbreak. It was notable that whereas Kenya—like most African countries—had not borne the brunt of COVID-19 infections in comparison to other countries outside the continent, its education sector was adversely affected. This followed the social distancing requirement that limited in-person gatherings—the low rate of infections notwithstanding—implying that its learning institutions, most of which operated on in-person mode, had to close. Since most universities in Africa had hitherto operated on this mode, the shift to online learning was not easy. Save for a few universities that had digital infrastructure, the rest encountered difficulties in moving to remote learning. Many had to quickly assemble digital curricula, the quality of which could not be guaranteed. Even if an institution managed to do so, not all students could be brought on board. Digital exclusion became more pronounced than ever before, with learners who were economically, technologically, and geographically disadvantaged missing out. Inequalities in education were laid bare and exacerbated. All this notwithstanding, Africa learnt lessons. The whole experience prompted various stakeholders—university management, faculty, and government—to rethink their modes of education delivery, with quality and access in mind. In retrospect, the pandemic could serve as a catalyst for digitalization in Africa's higher education system.

Keywords: Africa, COVID-19, Kenya, online learning, higher education

INTRODUCTION

The SARS-CoV-2 outbreak and subsequent pandemic has had far-reaching global impacts, including on the education enterprise. Various non-pharmaceutical interventions were proffered, key among them social distancing that necessitated the limiting of in-person gatherings. This led to the closure of many learning institutions globally. Africa is observed to have borne the brunt of the pandemic's effects on education (Marinoni et al., 2020; International Association of Universities, 2020b). It was estimated that 95% of learning institutions closed (GUNI, 2020), a situation that was largely attributed to low uptake of educational technologies. The International Association of Universities'

Global Survey on the impact of COVID-19 on higher education around the world established that Africa had the highest percentage of higher education institutions affected, with 77% of campuses closing down (International Association of Universities, 2020a). This paper focuses on Kenya, a country located in the Eastern part of Africa, and describes how higher education was affected. It further contains anecdotal references from the author's personal experience both as a post-graduate student, and a tutor in one of Kenya's university colleges, in the wake of the disruption that COVID-19 caused in the country's university education.

Notably, the state of preparedness by the country's individual universities and colleges in terms of online education greatly determined the magnitude of the disruption of their academic calendars: The more prepared an institution was, the less harm it suffered (Yan, 2020). There existed cases where institutions closed down completely so that their administrative wings could sit and strategize the next course of action.

FACULTY PREPAREDNESS AND INSTITUTIONAL INFRASTRUCTURE

Generally, Kenya's education landscape does not have a robust online education infrastructure (Barasa, 2021; Wachira and Ombati, 2020; Suhonen et al., 2016). As a matter of fact, approximately 60% of the country's universities opted for remote delivery modes in a bid to mitigate the disruption; however, there were reasons to worry concerning the success of such experiments, given that most of the higher learning institutions had not, prior to COVID-19 eruption, established online learning platforms. Various reports indicated the unpreparedness of most higher education institutions in terms of requisite capacity to conduct virtual learning (Nyerere, 2020). This would explain why, when universities declared a shift to online platforms, the country's Commission for University Education wrote to them demanding they establish the quality of online learning that they were offering in the wake of COVID-19 break (Wanzala, 2020).

Admittedly, there has not been a coherent articulation of what the institutions meant when they talked about online learning. This could be illustrated by the nature of technological tools that would be employed to conduct remote delivery of education. For a start, some faculty used electronic mail to send reading materials and assignments to students. Social media platforms were equally employed, for example, Facebook, WhatsApp, and Telegram (Omulando and Osabwa, 2021), which were viewed as popular channels of communication. The latter two were used to transfer course content as well as completed assignments. These activities were largely asynchronous.

Away from the adherents of asynchronous learning, there existed another group of faculty who believed that remote delivery methods were supposed to be exclusively synchronous, characterized by virtual live engagement. For them, the notion of blended learning was alien. Consequently, they contemplated a real-time engagement that is conducted through internet-based online delivery. When this state of

affairs is obtained, it is highly unlikely that such faculty will be as open-minded as to think of creative and innovative ways of interacting with students in the absence of a robust online learning platform. As such, they may sit back awaiting the end of the pandemic, or establishment of what they consider a typical online platform. Without prejudice, the foregoing seems to have been the case, so that the faculty's consequent inaction negatively impacted on the students already enrolled in their classes. Anecdotally speaking, the author of this paper observed cases where students within the same institution and departments would miss out on classes, owing to technological incapability of the tutors in the respective courses, while their counterparts—who had technologically savvy tutors—continued with their studies. Students would therefore lag in some courses but excel in others, depending on the technological orientation and capability of their lecturers.

It is worth noting that things were not easy for faculty who attempted basic modes of online education, even as they regarded them as stop gap measures. First, many public universities and colleges in the country had huge numbers of students. This implied that faculty had to contend with numerous file documents submitted by students following completion of assignments. It was confounding, for instance, how a lecturer could handle over a thousand submissions in their email inbox from students in their various courses. Indeed, some of those completed assignments were sent *via* WhatsApp, Telegram, and such like applications; downloading and consolidating all these was not an easy task. Weary of this tedious undertaking, most faculty resorted to sending lesson notes to students one-way, in the hope that the pandemic would subside to give way for physical gatherings, the latter making way for administration of examinations. Furthermore, practical-oriented courses were halted for the time being, but having had problems with online instruction, it would not be logical for one to expect the institutions to administer online assessment and examinations, much less, to conduct practical lessons virtually. Indeed, the few universities and colleges that attempted administration of online examinations faced questions over the credibility of the testing, since most had not proctored requisite software that would guard against examination cheating (Kibuku et al., 2020; Awandu, 2021).

The foregoing exposition pointed to two major problems as pertains the effect of COVID-19 to higher education in Kenya. First was the faculty's unpreparedness to handle teaching and learning using other modes apart from the in-person one, and second, the institutional unpreparedness in terms of online education infrastructure. On the first problem, it emerged that most faculty had not given prior thought to the issue of virtual delivery modes, reason as to why they did not immediately resort to the easily available online applications such as Zoom, Google Classroom, and Microsoft Teams video conferencing facilities (Tarus et al., 2015; Mutisya and Makokha, 2016). Faculty readiness in terms of technological knowledge is a prerequisite for effective online education (Koehler and Mishra, 2005). Furthermore, the fact that faculty were not ready implied that they would not be helpful to their students even if the latter were ready.

On the second problem, institutional incapacity in terms of infrastructure for online delivery meant that faculty and students would not do much. For instance, universities that had not procured Learning Management Systems left students at the mercy of their tutors' creativity and initiative. Furthermore, tutors who had the technological know-how could not do much in the absence of a robust institutional online education platform. Since examinations (at least for those students who had been taught through virtual delivery modes) could not be conducted owing to lack of requisite online platforms, and since tutors could not proceed to the next courses before examining students on what they had been taught, the academic calendars of these institutions stalled. Consequently, they closed for extended periods as the pandemic raged on.

The problem of faculty unpreparedness was not limited to technological know-how. Their ability to prepare digital content came to question as well. Online education experts emphasize the need for a tailor-made content that suits the demands of online education (Dzubian and Picciano, 2013; Martin et al., 2019). Furthermore, they insist on integration of knowledge on content, pedagogy, and technology if online learning is to succeed (Koehler and Mishra, 2005; Lichoro, 2015). However, considering what transpired in many institutions of higher learning in Kenya, where content designed for the in-person mode was wholly shifted online, there was a reason to worry over the efficiency of such instruction.

For instance, there were instances where faculty would lecture for several hours over platforms such as Zoom and Google Meet, a situation that was likely to have a negative impact on the concentration span of students. It should be noted that most students used mobile phones in place of tablets and computers. Whereas they were fond of using the former to connect to the internet, it was not granted that they would equally be comfortable following up online classes using the devices. For instance, one can be online for two consecutive hours, visiting different captivating sites, but find it difficult to concentrate for the same duration listening to a monotonous lecture. Furthermore, some faculty were inadvertently insensitive to the nature of materials they shared over these platforms. For example (anecdotal), a lecturer would upload a file containing graphics, a situation that required students to incur more in terms of data charges when downloading the content. Similarly, some of the files would be in formats not supported by students' devices. This resulted in anguish and frustration on the students' side, making them lose out and consequently develop resistance to online education. Faculty were not spared either, as it implied that they could not achieve their preset expected learning outcomes. Furthermore, it bothered them to know that their students were disadvantaged in various ways, yet there was not much they could do to assist them cope with the "new normal."

Considering the foregoing, Kenya was ostensibly set for difficult times as online education became a necessity. The situation stood in contrast to other parts of the world where online learning had been relatively well-established, so that such countries—whereas they experienced differentiated challenges—did not have to begin from scratch. For instance, it had been reported—even before COVID-19 breakout—that

online education among higher education institutions in Western countries had flourished (Allen and Seaman, 2014). Furthermore, their transition to exclusive online education was relatively easier since they had prior experience (Fox et al., 2020). For them, expansion of online education was a vital cog in their institutional strategic plans (Instructional Technology Council, 2013), and, as they observed, it helped them boost student enrolment since students would learn from whichever part of the world without, off-campus. Whereas this was the case in most developed countries, Africa largely operated along the in-person mode, a situation that contributed to its vulnerability when the social distancing requirement became necessary.

Concerning the second major issue: online education infrastructure, most higher education institutions in Africa had not, by the time COVID-19 broke out, lay a strong foundation. Previously, various studies had been done concerning the state of online education in Kenyan universities, for example (Hadullo et al., 2017; Oketch, 2013). Of importance was one that focused on Jomo Kenyatta University of Agriculture and Technology, the country's *de facto* lead institution in the field of science and technology. In the report, various challenges were found to be militating against smooth execution of online education: less funding, poor infrastructure, and lack of an Information Communication Technology (ICT) culture that could have seen the institution integrate the latter in its daily operations. This was in 2018, and it was highly likely that these challenges had not been entirely surmounted by the time COVID-19 erupted.

Indeed, other universities had initiated some learning management systems, for instance, Moi University, which had an online platform dubbed MUSOMI (Moi University System of Managing Instruction); Kenyatta University's Kusoma; Maseno University's e-Campus platform, among others. However, these had not gained traction owing to lack of ICT culture within the institutions.

Even so, Kenya was not ready to facilitate online education as exemplified by its low internet connectivity as well as poor electrical infrastructure. There were many parts of the country where mobile network connectivity was erratic, and where it existed, the signal was weak. This was quite discouraging, since one could not access the internet even if they had the know-how and requisite devices. Furthermore, the intermittent supply of electricity, at least in areas that had been connected to the national grid, worsened the bad situation. Implicit, faculty who resided in the disadvantaged regions could not access the internet. hence were both helpless, and unhelpful to students.

STUDENTS' EXPERIENCE OF ONLINE LEARNING

Students suffered immensely when learning was moved to online platforms. Not only were they unprepared cognitively but socially and economically as well. It should be noted that most students, especially in Sub-Saharan Africa, are from areas experiencing high poverty. These students do not have the training in digital literacy that primary and secondary schools provide. It is therefore not uncommon to meet a first-year college student

who has never used a digital device such as a smartphone when attending college for the first time. Therefore, when everyone was made to shift online, most students experienced difficulties even on the most basic practices such as connecting online. There were cases where they bought new mobile phones, but owing to lack of experience, could not install browsers that were compatible with user-friendly applications. Furthermore, most could not afford data charges, much more, maintaining power since their homes were not connected to the power grid. Coupled with low-speed internet, the whole experience could be described as gruelingly frustrating. These challenges had been foreseen in previous studies (Muuro et al., 2014; Mutisya and Makokha, 2016). In the final analysis, it was defeatist for African institutions of education to move online without consideration to the existing infrastructure.

The fact that basic smartphones were the dominant devices used by students meant several things. First, the students, as mentioned earlier, strained a lot in a bid to keep up with classes, and even read the notes sent by their lecturers, owing to the tiny screens. Second, lack of personal computers meant that they could not type their assignments and submit for evaluation. In a study carried out in one of the university colleges, 99% of students had smartphones, while only 10% possessed personal computers (Omulando and Osabwa, 2021). This largely reflected the situation across the country. In cases where lecturers insisted on submission of the completed assignments, students would be forced to seek typesetting and printing services from commercial cyber café attendants who charged them exorbitantly. Third, the internet connectivity for the smartphones was dependent on telecommunication service providers. For instance, some areas were only covered by a certain service provider, say Safaricom or Airtel, and whenever they suffered a downtime, however infrequent, no connection would be enabled.

Lack of digital devices and internet connectivity were not the only problems, however. There were cases of students would have both the device and connectivity, but fail to access online classes owing to the communication tools and applications used by lecturers. For example, the most easily available video conferencing tools such as Zoom and Google Meet had set limits on the number of participants they would admit, in cases where users preferred the non-commercial versions. However, some faculty, unable to procure the commercial versions of these applications, resorted to free ones oblivious of the students that would be locked out. This was an indictment on the institutions as well, since most faculty resorted to individual choice of online platforms owing to the inability of the institutions to provide definite, comprehensive ones. The net result of all these was an entrenchment of inequality in the Kenyan higher education, since students who did not have the wherewithal of connecting online either received little tuition or deferred their studies altogether, while those who were lucky to have all the supportive devices and environments proceeded with their studies. It was not surprising that many universities closed, sending students home while they sought for ways of establishing online education infrastructure and training faculty.

WHICH WAY FOR HIGHER EDUCATION IN KENYA, AND BY EXTENSION AFRICA?

Were Kenyan universities and colleges ready to respond to a digital challenge presented by COVID-19? The answer is a definite no. Ideally, online learning requires a huge investment such as training of staff, acquisition of instructional designs and technologies, creation of institutional central online platforms, and packaging of courses into online digital mode (Batty and Hall, 2020). This was not the case in most parts of Africa. Furthermore, research had established that academics and students who experienced challenges owing to their unfamiliarity with remote learning environments became reluctant to accept and adopt technology use in education, much more, embrace the new online education design (Flavell et al., 2020).

Indeed, Dzubian and Picciano (2013) aver that even with online mode of teaching and learning, instructors would still have to make decisions concerning pedagogical implications. For instance, they ought to know when synchronous and asynchronous interactions are appropriate, and when to employ either competitive or cooperative pedagogies, among many other options. Decisions concerning appropriate ways of encouraging student involvement (for example through chats on discussion boards), choice of suitable delivery methods, choice of suitable assessment mechanisms, and general administration and management of online courses can best be made if faculty are competent enough (Passmore, 2009). It was also critical to have mechanisms that would prevent unfounded practices from being replicated under the guise of online education (Mohamedbhai, 2020), where, for instance, an instructor would just exclusively upload lesson notes and recorded audios onto learning management systems, or send them *via* electronic mail and other media, and claim to have taught.

This is to say that once online learning is established, there ought to be interventions that would guarantee quality in terms of content and methodology. Such require thorough preparation amidst monitoring and evaluation (Hadullo et al., 2017). In the developed world, for example, preparation of digital course designs and content is outsourced to experts who ensure quality and objectivity. This could be extremely helpful in the Kenyan situation, given that majority of faculty were not well acquainted with preparation of digital curricula (Omulando and Osabwa, 2021). Furthermore, assessment of knowledge gaps, an aspect that was absent in online programs mounted by majority of African institutions of higher learning, may have to be established. It is instructive that developed countries carry out web-based knowledge assessment of new users or trainees before taking them through online courses (Lichoro, 2015). Such practice may be helpful in the case of African higher education so that students' entry behavior is determined, for instance their levels of digital literacy, to allow for interventions specific to the students' inadequacies.

The answer to the crisis of digital unpreparedness in Africa lay in the capacity development of the aforementioned triad: staff, students, and infrastructure. Universities had a responsibility to develop central digital platforms, train their staff on innovative

educational technologies, synchronize support systems and databases, and develop both digital curriculum tools and course content. It is imperative to acknowledge that majority of the student body, especially in public universities, could not afford devices compatible to virtual proctoring tools necessary for remote supervision of examination. Furthermore, universities and colleges were constrained by financial deficits, making it difficult for them to procure robust digital platforms. A case in point was Kenya, where three public universities—Moi, Kenyatta, and Nairobi—had been directed by the International Monetary Fund (International Monetary Fund, 2021) to cut down staff and do away with some academic and administrative department so that they sustain their operations, in consideration of their increasing financial deficits.

It had been established by a Durham University report (Higgins, 2020) that rushing into a system previously not in place was counterproductive. Some students lacked basic digital literacy, a matter that could be addressed through a basic education program. In Kenya, such a program had been initiated in 2013 (Barasa, 2021) but then collapsed owing to lack of adequate government funding. Whereas the government had promised to supply digital devices to learners, and equally partnered with broadband service providers to realize connectivity and affordable internet for students, this has not happened. Regardless, the new normal required that Kenya, like other African countries, unconditionally align itself with the new reality.

African universities, by and large, had their learning calendars disrupted. This led the African Association of Universities to advise the institutions to adopt alternative educational delivery methods away from the face-to-face one (Association of African University, 2020). Zoom and Google Classroom were recommended, and tutors advised to record class sessions and send the recordings to students *via* email and WhatsApp. Furthermore, they were to resort to Massive Open Online Courses (MOOCS) that matched what they (universities) offered, a move that aimed to cut costs and reduce time as far as design of new online courses and institutional platforms were concerned. The International Association of Universities (IAU) singled out developing African countries as the most affected by the disruption (International Association of Universities, 2020b). Be that as it may, there existed cases that inspired hope. The National University of Lesotho, Lesotho, for instance resorted to its digital version, with its LMS, *Thuto*, and the university's library website and digital content being available online (Mbambo-Thata, 2020). However, the university did not immediately establish whether all students accessed the online sites.

Ghana, situated in West Africa, is reported as one of the countries on the continent with a foothold in online education (Kotoua et al., 2015). Regardless, 50% of learners had no internet connection by the time of the report. In Nigeria, an analytical study concerning online education during the pandemic reported that students were not satisfied with virtual learning (Egielewa et al., 2021), hence did not want it to continue after the disease lapses. This position was informed by the challenges they encountered owing to poor internet connectivity and unsteady electricity. Similarly, a study conducted in five African universities revealed that whereas learners were receptive to online education that had commenced after COVID-19 broke out, approximately 70% of both students and lecturers considered it ineffective owing to lack of supportive milieu: inadequate computers, unreliable electricity supply, poor broadband connectivity, lack of technical support, inadequate technological and pedagogical skills, and lack of relevant policies (Paschal and Mkulu, 2020). If these were addressed, then online education would likely bear desirable education outcomes.

Hence, this paradigm shift and alignment implied that some disruption, albeit momentary, will be witnessed in the education sector. First, quality of education is likely to drop—at least in the intervening period. This paper had already made reference to digitally unseasoned faculty and students, who were experiencing difficulty in adapting to remote delivery modes. The shift to the online mode amidst such unpreparedness would mean that the not-so-ready staff and students would be left behind for a while as they strive to adapt to the new reality. Overall, some studies had generally established that students of whichever geographic extraction tended to record lower achievement scores from online learning compared to in-person experience, in cases where the former were either least prepared or somewhat disadvantaged (Dynarski, 2017).

Second, both faculty and students will develop a major interest in digital literacy, given the necessity of such knowledge and skills. The social distancing health protocols necessitated by COVID-19 have intensified dissemination of information concerning online education solutions, some that were hitherto unknown to Africa. There is a likelihood that faculty and students will be curious to know more, lest they get disadvantaged again. Furthermore, universities and colleges that managed the transition relatively well are likely to attract more students in the future, especially those who are tech-savvy, since this will guarantee the students uninterrupted studies in the event that the pandemic persists, or recurs after dying down. African universities will therefore need to devise contingency plans for any disruptive eventuality, and build digital capabilities that will help them reap the benefits of online education (Muftahu, 2020; UNESCO, 2020).

CONCLUSION

COVID-19 wreaked havoc across the world. Nonetheless, it reminded the education players in Kenyan universities, and African ones in general, on the need to be ready for any eventuality. African governments may be forced to lay firm structures that will support online education so that blended learning becomes the norm. With the latter, it will be possible to switch to the online mode when circumstances such as those occasioned by COVID-19 ensue. Issues of broadband connectivity, electricity supply, subsidies on computer devices, and capacity building among faculty have to be addressed through budgetary allocations. Partnerships with developed worlds are equally important, as demonstrated by Rwanda—a small country that emerged from destruction caused by a 1994

genocide—which is increasingly investing in digital literacy through assistance from Google, among other development partners. When the environment is supportive, this paper has established that both students and lecturers will be receptive of online education. Most importantly, it is highly unlikely that Africa, despite its technological downsides, will revert to purely face-to-face modes of teaching and learning. The least that will be expected is the blended mode, so that the new normal will be characterized by a sustained focus on the huge demand of, and

challenges around virtual teaching and learning, with access to and quality of online education being central.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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