Sustainability Practices at Private Universities: a state-of-the-art assessment

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Abstract

Private universities also play a key role in the sustainability debate. But despite their importance, there a shortage of research on how sustainability is being implemented at private universities. Based on the need to address this gap, this paper investigates the nature and diversity of sustainability-based practices undertaken at private universities. It outlines the ways private universities see and perceive sustainability, and examines by means of a survey involving 10 universities from across all geographical regions which educate over 150.000 students, how these universities incorporate sustainability-related practices, as part of their operations. The results suggest that, unlike their public counterparts, about half of the respondents stated that they do not have projects undertaken to promote sustainability in local communities or in their respective regions. Also, some private universities perceive themselves as leaders in sustainability in higher education, while some are still developing a more robust sustainability profile. The conclusions of the paper are that the special features related to sustainable development teaching and research at private universities need to be better identified, in order to involve them more on sustainability efforts. Also, whereas many of them are highly engaged on improving energy efficiency, reduce greenhouse gas emissions, promote sustainable water usage and promote sustainable landscaping, there is a need for them to also engage in other areas. Finally, private universities should engage on further efforts to increase their sustainability activities, which are beneficial to them in financial terms, as well as in respect of their image and their operations.

Keywords: sustainability practice, private university, sustainability in higher education, sustainable development network, sustainable university

1. Sustainability at Universities: the role of universities in promoting Sustainable Development

Due to a strong emphasis on the use and depletion of natural resources, the current economic development model adopted by many countries cannot be considered sustainable and resilient. This has been the consensus worldwide for a long time. Over the years, sustainable development has become an ongoing issue, not only in the academic community but also among international organisations and governments (Paoli and Addeo 2018). In the late 1980s, the report "Our Common Future" called to humanity for action and established the concept of sustainable development, setting forth the formal idea that development must meet the present needs without compromising future generations, while considering the economic, social and environmental axes (WCED 1987; Paoli and Addeo 2018). Sustainable development is considered to have a key role in creating a promising future for human societies, and it can support the abilities to respond to pressing global challenges (Pirouz et al. 2020; Andrijevic et al. 2020). The COVID-19 pandemic is the greatest challenge humanity has faced since World War II (UN 2020a). Its impacts have reinforced economic development that considers ecological balance and preservation of human quality of life (UN 2020b; Pirouz et al. 2020), and never before has the sustainable development concept made so much sense.

As it involves different types of institutions, new models and values are imperative for sustainable development practice (Gore 2015; Stafford-Smith et al. 2017). The role of universities as agents of change in economic development is well known, but this context has led to a reflection on the possibilities that universities have in contributing to the transformation of societies, incorporating a sustainable perspective into their habitual practises (Leal Filho 2011; Wakkee et al. 2019).

Increasingly, higher education institutions around the world are including sustainability in their practices as a part of their institutional core (Ramos et al. 2015). Indeed, the 'advancement of sustainability through various functions such as education, research, and outreach will increasingly constitute a core mission for universities' (Beynaghi et al. 2016). Successful strategies have been reported for many years; however, universities still face many barriers in transforming sustainability in theory into practice, considering the lack in planning and the holistic integration of sustainability in their systems, the curriculum and research (Leal Filho et al. 2015; Leal Filho et al. 2017; Leal Filho et al. 2019a).

The implementation of the Sustainable Development Goals (SDGs) is a current global challenge. There are a number of complex actions to be undertaken in different socioeconomic contexts and geographic levels (local, regional, national and international) in a short period of time (Leal Filho et al. 2018; Plag and Jules-Plag 2019). Therefore, different sectors of society must be involved in the development of efficient and comprehensive alternatives. Higher Education Institutions (HEI) are able to lead such a process by producing novel knowledge and high impact research and by cooperating with companies and local communities (Leal Filho et al. 2018; Leal Filho 2020). It is through interconnected teaching, scientific and technological development, and extension programmes that universities may prepare future professionals and decision makers, such as entrepreneurs, teachers, community leaders, health workers, and politicians (Carvalho et al. 2017; Probst et al. 2019).

To fulfil their role in promoting sustainability as a whole and the SDGs in particular, universities have established new paradigms focused on current and future social and environmental challenges (Lozano et al. 2013). In order to do so, these institutions have supported 'curriculum development, collaboration and social learning mechanisms' (Bayuo et al. 2020, p. 3). Regarding curricular innovation, the inclusion and deepening of the discussion on the SDGs in different courses should be highlighted. The approach used is transdisciplinary,

since integration is more effective than offering isolated courses on the subject (Schneidewind et al. 2016). The use of problem-based learning techniques, for example, allows students to reflect on initiatives that meet real-world sustainability challenges. In this way, the joint work of academics and the community is encouraged, ‘fostering the links between the theory and the practise of sustainability’ (Leal Filho 2020, p. 835).

The number of HEIs committed to developing sustainable technologies in various areas of knowledge is increasing (Berchin et al. 2020). According to Leal Filho (2020, p. 835), for such an aim to be successful, there must be ‘the existence of a robust research programme with externally-funded projects handling sustainable development matters’. In addition, these initiatives become especially relevant when they take regional aspects of SDGs into account. When considering local specificities, universities may achieve a greater engagement of different groups of social agents, making the exchange of knowledge easier and the public sustainability policies strong (Radinger-Peer and Pflitsch 2017; Leal Filho et al. 2019b).

Several universities have been actively promoting the SDGs, including action plans for the management of their resources, direction and organisation of activities, quality improvement of life on campus, and social innovations (Steinemann 2003; McMillin and Dyball 2009; Bauer et al. 2020; Bayuo et al. 2020). The efficient use of financial, natural, and human resources involves changes in campus operations, such as waste reduction, energy efficiency and reductions in the use of toxic substances to protect the health of staff and students (Steinemann 2003; Lo-Iacono-Ferreira et al. 2018). These practises result in benefits, such as increased revenue and productivity, improvement of the work environment and people's satisfaction, conservation of natural resources, and better relationships with the surrounding community.

2. Management practices at private universities

The function of private university and university governance

Compared to public universities, it can be expected that private universities are more flexible and react more quickly to demands from external stakeholders. A reason for this is that they rely on students paying for their studies, which makes them more vulnerable to demographic changes and changes in funding for their day-to-day operations. The impact on teaching and sustainability practises may differ, depending on the requirements from the labour market. In particular, private business schools aim to deliver students ready for functioning in the current economic system and to fulfil the requirements of the large employers (e.g., Smith 1994; Molho 1997; Ehrensal 2001; Platje et al. 2019). This may not promote the inclusion of sustainability practices in the curriculum, as well as in university governance structure, strategic goals and management practises. As a consequence, 'delicate diplomacy [is required] to circumvent entrenched beliefs and vested interest in students and universities' (Platje et al. 2019, p. 1221).

Creating a sustainable university may be a real challenge, as the governance structure is complex, potentially even an 'organized anarchy (Cohen et al. 1972), characterised by overarching government priorities and temporal factors (Gohari et al. 2019), a fuzzy or opaque use of technology, and unclear institutional culture. These aspects may conflict with governance structures and institutional strategies to limit the integration of academic activities into societal development (Gohari et al. 2019). Governance structures are moving from the traditional concept of the university as a 'republic of scholars' to a 'stakeholder organisation' characterised by conflicting challenges of academic freedom and decision making taking place within hierarchical structures (Bleiklie and Kogan 2007). Such complex governance structures may also influence the commitment of staff to the development of the university: it may be weak when personal research and teaching interests prevail.

As in many organisations, goals may be myopic within universities, while there may be a lack of reflection on long-term sustainability issues as well as on the justification of decisions (Alvesson and Spicer 2012; Platje et al. 2019). While universities are supposed to provide benefits for people and society, the complex governance structure may lead to ignorance of this aim (Van Dam and Webbink 2020) or, where it is recognized, the ability to resource and implement it. The conflict of long-held institutional dynamics and the growing short term organisational goals (number of students, satisfying funders, economic goals, etc.) create a huge challenge in developing internal sustainability practises, such as environmental health and gender practises, as well as supporting wider societal development.

The availability of funding at private and public universities

The considerable efforts to support sustainability practises at HEIs have made significant progress in recent years. The adoption of sustainable practises in institutions seems to be connected to the issues of finance (Vagnoni and Cavicchi 2015). Ambitions to support sustainable and renewable energy practises by universities have led to significant increases in demand for financial support (Fitzgerald 2017). According to De Filippo et al. (2019), the primary source of funding for sustainability practices at Spanish universities came from European calls for projects. The report of the Centre for Technological Development in the industry in the Seventh Framework Programme (FP7.2007-2013) ranked Spain in sixth place according to funding received (after Germany (17.8%), United Kingdom (17.2%), France (12.5%), Italy (9.3%) and Netherlands (8.4%)) as it had under FP6 (De Filippo et al. 2019).

Funding for universities can be a driver for sustainable management practises and practical interventions. Public institutions, which are primarily funded through state taxes, are subject to contractual pressure to implement sustainable management practises in response to the receipt of public money, whilst private institutions are subject to less external stakeholder pressure as they rely heavily on unconditional grant, endowments and donations. Some

universities, particularly those in public-private partnerships, value the means and methods of funding for improving standard and quality practises (Al-Hanawi and Qattan 2019). Such contracts promote sustainability practises within the finance, design, development and maintenance of on and off campus facilities.

It should be recognised that countries are unique in how they structure funding for higher education. Where sustainability has made the highest gains in informing higher education, there are two dominant models—public or private funding. In the United States, for example, outside of the Ivy League universities, many of the leading HEIs are in some capacity public universities, where some percentage of the funding comes from the state government in the state where the university is located. Many of these funding streams are related to the US Morrill-Land Grant Acts of 1862 and 1890, which also open these universities to federal funding.

Health issues

Health-related issues such as stress, anxiety and depression are common among university students (Bayram and Bilgel 2008; Prajapati et al. 2017). These issues may negatively impact their daily activities and impair their studies (Prajapati et al. 2017). Among the common health problems seen in the student population, mental and sexual health issues are also commonly found (Eisenberg et al. 2007; Bayram and Bilgel 2008; CDC 2012), especially in universities in developing countries. According to a study conducted in universities of Pakistan, students and teachers tend to have a negative attitude while dealing with people with mental illness like Schizophrenia, depression, drug and alcohol disorders (Javed et al. 2006). Moreover, discussions about sexually transmitted diseases are still considered a taboo in Malaysia (Wong and Sam 2010). In addition, many studies suggest that university students are not fully aware of sexually transmitted infections in countries like

Malaysia (Widjaja 2019), Nigeria (Oluwasola et al. 2019) or Pakistan (Khan et al. 2016). For example, a study conducted among private university students in Malaysia showed a limited knowledge about Human Papilloma virus (HPV) and its vaccine, with a majority of the respondents being female students (Widjaja 2019).

Studies have also shown that university students tend to have poor eating habits (Bipasha and Goon 2014; Yun et al. 2018). They tend to prefer junk foods and sugary soft drinks because of their easy accessibility and availability, thus often living rather unhealthy lifestyles (Baig et al. 2015) (Bipasha and Goon 2014). For instance, 98% of students in four private universities in Bangladesh admitted to consuming fast food (Bipasha and Goon 2014). However, it is not that students are completely unaware of the negative consequences of unhealthy food, such as obesity and other health-related complications. Rather, there seem to be gaps in knowledge concerning the prevention of such complications. Therefore, further and more specific research is needed to facilitate a deeper understanding regarding the perception of health problems in private universities.

In respect of sustainability, given the coming demographic contraction as the children of baby boomers have had fewer children who will soon be college age, many private universities are situating themselves to be leaders in this field. These universities have more flexibility in their marketing, operations, hiring, and governance structures as they are not beholden to state or national-level regulations related to funding and revenue streams. Given this unique situation, and also the added pressure to be financially solvent as a private enterprise, it is important to know how private universities are utilising sustainability to remain competitive, while also advancing what sustainability in higher education resembles.

This insight structured the methods of this article, which is a survey-based analysis of a sample of pre-selected private universities engaged in sustainability activities. They were selected based on three main criteria: their geographical distribution (covering various

geographical zones), the extent of their sustainability activities and the existence of proper documentation, which may allow their work to be investigated. Their analyses activities are a mix of curricular, co-curricular, facilities, and procurement practices.

3. Methods

The aim of this paper is to investigate the nature and diversity of sustainability-based activities that are being undertaken at private universities. A key focus of the research's design is to outline the ways in which private universities address sustainability and to examine how these universities incorporate sustainability-related practices as part of their strategies, policies, actions, and operations. To attain the research aim, a cross-sectional descriptive research was carried out through a descriptive multiple-case study. Yin (2013, p. 45) defined case study as an 'empirical method that investigates a contemporary phenomenon in depth and within its real-world context'. The boundaries between the analysed phenomenon and the context may not be plainly evident. According to Saunders, Lewis, and Thornhill (2009) and Wiid and Diggines (2010), the purpose of descriptive research is to portray an accurate profile of studied events or situations to describe the research domain accurately and thoroughly.

The applied methodological procedure followed the model designed by Runeson, Höst, Rainer, and Regnell (2012), in which it is comprised of four stages: a) definition and planning; b) data selection/collection; c) data analysis; and 4) reporting, as shown in Figure 1.

[Figure 1 near here]

In order to understand the sustainable practices at private universities, the study was led by a structured data collection roadmap to analyse the available data from the HEIs websites and sustainable development networks, in the case of those companies that were part of an association aimed at promoting the sustainable development of HEIs. Finally, the study also analysed reports on sustainability assessment tools sites, such as STARs and GRI.

The data collection roadmap (Annex 1) was composed of 19 questions divided into 5 sections. The first section comprises the characterisation of the HEIs. The second section regards the actions undertaken to include sustainability in learning, researching, and outreaching routines. The third section was devoted to campus operation and aimed to collect data regarding policies and actions related to reducing consumption, improving energy efficiency and water usage, promoting the sustainable management of landscape, green purchasing, reducing emissions, and adopting renewable energy fonts. The fourth and fifth sections aimed to collect data regarding sustainable development networks and assessment tools, respectively.

The methodology of this paper is tethered to the selection of 10 private universities from disparate geographical regions (Latin America, North America, Europe, India: Figure 2) attended by over 157,000 students from around the world (Figure 3). Their selection presents a representative sample of the broad ways in which higher education is engaging sustainability at international levels. Some of those chosen are domestic leaders in sustainability in higher education (Wake Forest University in the US, Pontifical Catholic in Brazil, Manipal and VIT in India [although the two HEIs in India would not be considered leaders when compared to their international peers in this study]), while some are still developing a more robust sustainability profile (WSB University, University of Monterrey, Regent's). Some were chosen for their size (Universidade Lusofona is the largest in Portugal), and others for their prestige (Jacobs) and the impact on emerging sustainability technologies that this prestige brings (MIT). All HEIs chosen are private universities and as such many maintain large donor networks, high endowments, and are nationally and internationally recognized for the quality of their education (MIT, Wake Forest, Jacobs). Graduates from these universities often end up in high-ranking domestic positions in the triple sector (government/civil society, for-profit, non-profit) and thus will have decision-making power in these sectors in the years to come. While outside the purview of this specific research project and article, further research questions related to these

specific universities would consider longitudinal studies on how their respective students are exposed to sustainability through their matriculation into the respective institutions, and if this exposure facilitates the operationalization of sustainability in the triple sector as the careers of graduates progress.

[Figure 2 near here]

[Figure 3 near here]

4. Results and Discussion

The type of the universities varies from private (Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA, Vellore Institute of Technology (VIT), India) to private, non-profit (Universidade Lusófona de Humanidades e Tecnologias (ULHT)), private, foundation and tuition driven (Wake Forest University (WFU), Winston-Salem, North Carolina, USA), private, non-profit, state-recognized university (Jacobs University Bremen (JUB) Bremen, Germany), charity (Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Brazil), private, non-profit (Regent's University London, UK), private, trust (Manipal Academy for Higher Education (MAHE), India), and private, charity (University of Monterrey (UDEM), Mexico). The WSB University in Wroclow is a private university that is functioning within the framework of a holding of the WSB Universities in Poland.

The structure of the high academic administration at the universities differs in the number and type of positions occupied, and presumably in assigned responsibilities and functions. Table 1 includes a detailed structure of the universities' academic administration.

Table 1 Structure of universities' high academic administration.

University	Number of people in high academic administration	Positions

Universidade Lusófona de Humanidades e Tecnologias, Portugal	4	- Rector (1) - Vice-rector (2) - Director (1)
WSB Universities in Wroclow. Poland	5	- Rector (1) - Dean (1) - Vice-dean (3)
Massachusetts Institute of Technology, Cambridge, Massachusetts, USA	8	- President (1) - Chancellor (1) - VP of Research (1) - VP for Open Learning (1) - Provost (1) - EVP and Treasurer (1) - VP and General Council (1)
Wake Forest University, Winston-Salem, North Carolina, USA	N/A	- President - Provost - Variety of deans
Jacobs University Bremen, Germany	15	- President/chairman of the executive board (1) - Managing director (2) - Governor (12)
Pontifical Catholic University of Rio de Janeiro, Brazil	7	- Gran-chanceler (1) - Rector (1) - Vice-rector (1) - Specific vice-rector (4)
Regent's University London, UK	7	- Vice-Chancellor (Chair) (1) - Chief Operating Officer (1) - Deputy Vice-Chancellor (1) - Finance Director (1) - Pro Vice Chancellor / Director of Human Resources (1) - Pro Vice Chancellor International and Dean, Faculty of Business and Management (1) - Pro Vice Chancellor Student Experience and Dean of the Faculty of Humanities, Arts and Social Sciences (1)
Manipal Academy for Higher Education, India	5	- Director (1) - Associate Director (2) - Vice Chancellor (1) - Pro Chancellor (1)
Vellore Institute of Technology, India	5	- Vice-President (3) - Vice-Chancellor (1) - Pro-Vice-Chancellor (1)
University of Monterrey, Mexico	16	- Executive board

Table 2 Universities' webpages on sustainability practices.

University	**Page on sustainability practices**

Universidade Lusófona de Humanidades e Tecnologias, Portugal	https://www.ulusofona.pt/lusofona-verde
Massachusetts Institute of Technology, Cambridge, Massachusetts, USA	https://sustainability.mit.edu/
Wake Forest University, Winston-Salem, North Carolina, USA	https://sustainability.wfu.edu/
Jacobs University Bremen, Germany	https://www.jacobs-university.de/news/exploring-sustainability-0
Pontifical Catholic University of Rio de Janeiro, Brazil	http://www.nima.puc-rio.br/category/sustentabilidade/
Manipal Academy for Higher Education , India	https://manipal.edu/mu/important-links/green-manipal.html
Vellore Institute of Technology , India	https://vit.ac.in/about/Sustainability
University of Monterrey, Mexico	https://www.udem.edu.mx/en/vive/sostenibilidad

Despite having some type of statement on either the environment or sustainability (we recognise that environmentalism and sustainability are not the same thing) somewhere in their website (Table 2), and for some even in strategic plans and mission statements (Appendix A), the ability to readily access information about sustainability goals and practices on the web domains operated by each institution was not always easy. For example, the majority of the institutions did not have information readily available regarding teaching technologies that are adopted to improve student skills regarding sustainable development (ULHT, WFU, Regent's, MAHE, UDEM). Some institutions did have such information, but this was relegated to a description of a course or program where these skills were offered (WSB, MIT, VIT), or it suggested actions that students could take (JUB, PUC-Rio). No institution had a clear plan for using teaching technologies to improve student skills regarding sustainable development in the entirety of their curricula.

The majority of the institutions did have information readily available regarding research for developing new technologies to boost sustainable development. Although a few did not (ULHT, Regent's, MAHE), many reported that they have a variety of faculty and centres or programmes devoted to researching and teaching sustainable development (WSB, MIT, WFU, JUB, VIT, UDEM). Some of these programs were devoted to applied research with partners in local

communities (JUB, MIT, UDEM), and some engaged graduate students (PUC-Rio, WFU, MIT).

Specific research on whether these institutes had information readily available regarding external projects undertaken to promote sustainability in local communities or in their respective region found that half did not (ULHT, WSB, Regent's, MAHE, VIT). However, five of the HEIs do take this aspect of their institutional identity seriously. Quite a few institutions centred regional partnerships in their reporting/public presence/marketing/recruitment and invest significant resources into building these partnerships in support of sustainability, often with these partnerships benefitting student learning and research opportunities about sustainable development and design (MIT, WFU, JUB, PUC-Rio, UDEM).

When investigating whether or not there is information readily available regarding external project execution to promote sustainability in the productive/commercial/for-profit sector, it was found that five institutions did not provide such information (ULHT, WSB, Regents, MAHE, VIT). It was found that the same five from the prior question did (MIT, WFU, JUB, PUC-Rio, UDEM).

The selected universities develop and implement sustainability-related initiatives on their campuses: **Error! Reference source not found.** summarises the policies and/or actions undertaken by the sample of analysed universities.

Table 3 Campus Operations Polices or Actions.

	Selected Universities									
Polices or Actions	ULHT	WSB	MIT	WFU	JUB	PUC-Rio	Regent's	MAHE	VIT	UDEM
To reduce consumption	●	-	●	●	●	●	●	●	●	●
On improving energy efficiency	●	●	●	●	●	●	●	●	●	●
To adopt renewable energy sources	●	-	●	-	●	●	-	●	●	●
To reduce GHG[a] emissions	●	-	●	●	●	●	-	●	●	●
To promote sustainable water usage	●	-	●	●	●	●	-	●	●	●
Towards sustainable food and diet practices	●	-	●	●	●	●	●	-	-	-

To promote green purchasing	-	-	●	-	●	●	-	-	-	●
To promote sustainable landscaping	●	●	●	●	●	●	●	-	-	●

[a]GHG: Greenhouse gas.

Policies or actions to reduce consumption

Among the ten analysed HEIs, only WSB University has no available information regarding policies or actions to reduce consumption. Nine of them have implemented operational strategies or actions to reduce consumption. It is in line with the work of Findler, Schönherr, Lozano, and Stacherl (2018), according to which, the majority of the effort in HEIs assessment has a strong focus on measuring sustainability development performance in the core element of campus operations. The Universidade Lusófona de Humanidades e Tecnologias (ULHT) has been developing wide strategies regarding the reduction of the use of plastic, energy and water, and MIT has a broad program related to managing waste reduction and recycling. Similarly, the Pontifical Catholic University of Rio de Janeiro (PUC-Rio) cites sustainable consumption as one of their stated targets in the Environmental Agenda. Most of the universities carry out programs to reduce energy and water consumption.

Policies or actions on improving energy efficiency, to adopt renewable energy sources, and to reduce GHG emissions

Energy efficiency, the adoption of renewable energy sources and the reduction of GHG emissions are considered central in implementing sustainable development practices into HEIs (Altan 2010; Larsen et al. 2013; Ramos et al. 2015).

The most current practices for improving energy efficiency adopted by the studied HEIs are the replacement of the lighting system with the use of led lamps and the installation of motion detection. WSB University, University of Monterrey, and Massachusetts Institute of Technology have invested in LEED-certified green buildings. Wake Forest University and Vellore Institute of Technology use solar thermal panels to provide domestic hot water. The Pontifical Catholic University of Rio de Janeiro and Vellore Institute of Technology have

invested in the acquisition of low energy consumption equipment, such as private virtual desktop cloud infrastructure.

Pontifical Catholic University of Rio de Janeiro, MIT and University of Monterrey purchase part of their energy from companies that produce it from renewable sources. MIT and Jacobs University also invest in cogeneration by a natural gas plant on campus, and Vellore Institute of Technology, Manipal University, and Universidade Lusófona de Humanidades e Tecnologias practise cogeneration through a photovoltaic panels plant. The latter also has a geothermal climatisation system in two of its campus buildings.

Estimating greenhouse gas (GHG) emissions has become a cornerstone of campus sustainability. These estimations are crucial in settling and tracking climate-related sustainability goals for HEIs to create innovative climate policies (Thurston and Eckelman, 2011). The action undertaken by the analysed HEIs concerning GHG emissions are varied. For instance, Vellore Institute of Technology and Pontifical Catholic University of Rio de Janeiro encourage campus users to adopt bicycles or ride share to reduce emissions. Manipal University controls vehicle emissions on campus. In parallel, this university and the Universidade Lusófona de Humanidades e Tecnologias plant seedlings to offset emissions. Jacobs University considers the entire campus to be a reduced traffic zone. MIT and Pontifical Catholic University of Rio de Janeiro state that one of their targets is to neutralise pollutant emissions from campus operation and activities.

To promote sustainable water usage

Meireles et al. (2018) asserted that there are two categories of strategies for reducing the amount of water in buildings: (i) behaviour change and (ii) system change. While the former comprises mostly non-structural measures (e.g., education campaigns), the later encompasses structural

measures such as water-efficient fixtures and retrofit appliances, rainwater harvesting and water re-use.

Wake Forest University, Jacobs University, and Pontifical Catholic University of Rio de Janeiro reported the adoption of educational campaigns to convince users to reduce the consumption of water on their campuses. Wake Forest also reported that design standards are in place for new facilities and for retrofitting the old ones. MIT, VIT, and MAHE treat and use storm water and waste water. Universidade Lusófona de Humanidades e Tecnologias and MIT deploy 'smart metered' irrigation systems around campus to conserve water. The University of Monterrey uses native plants in its gardens to reduce the need for irrigation.

Towards sustainable food and diet practices

Most of the catering service at the HEIs is offered by a contracted company. MIT has selected a list of preferred campus caterers that meet the sustainability practices criteria, including the use of reusable flatware, serving dishes, etc.

The enterprises hired by Wake Forest University and by Regent's University demonstrate commitment to sustainability. One of the three cafeterias on campus at The Universidade Lusófona de Humanidades e Tecnologias provides alternative and healthy food. Jacobs University offers workshops to the students about sustainable food.

To promote green purchasing

Only four of the institutions analysed provided information on green purchases. MIT is the one with the most available data regarding this theme. It has published sustainability criteria relating to the purchasing of several products, such as chemically intensive services, IT products and suppliers, furniture, wood, and paper, among others. MIT has developed the MIT Sustainable Design Standard, which is based on LEED V4 and requires a minimum of Gold Certification

for all new construction. The University of Monterrey hired a cleaning services company certified in terms of using sustainable products. The Pontifical Catholic University of Rio de Janeiro encourages the purchasing of sustainable materials. Jacobs University recommends that students look for second hand items to recycle.

To promote sustainable landscaping

Some universities like Pontifical Catholic University of Rio de Janeiro were built in a forested area. Of the four institutions that indicated their green area, the largest is Wake Forest University with 100 acres, followed by MIT with 97 acres, and Jacobs University with 84 acres. The smallest green area is Pontifical Catholic University of Rio de Janeiro, with a green area of less than 1 acre. MIT has an inventory of trees and seeks to maximise use of the hydrologic system for the maintenance of campus vegetation on highly constrained fill soils. The University of Monterrey uses native plant species that are better adapted to local climate conditions. Universidade Lusófona de Humanidades e Tecnologias recognizes the importance of its green area in capturing CO2.

The results show that there are differences amongst the private universities concerning networks and assessments, regardless of their geographical region. Their characterisation concerning sustainability in the institutional documents seems to be important for their implementation and commitment to sustainable development. The analysis is as follows and can be consulted in Table 4 and Appendix A.

Universidade Lusófona de Humanidades e Tecnologias (ULHT) is the largest private institution in Portugal. Despite mentioning sustainability in the strategic plan, ULHT´s adoption of sustainability in the mission, vision and goals are only peripheral (see Appendix A). This might

explain the inexistence of a network for boosting sustainability as well as the lack of assessment (see Table 4).

Manipal Academy for Higher Education (MAHE) and Vellore Institute of Technology (VIT) present the same results. It seems that sustainability is addressed through their mission, vision, goals, and strategic plan, which are considered standard (see Appendix A). Nonetheless, they do not seem to take part in any network for boosting their sustainability, nor are they a part of an innovation ecosystem or even have an institutional framework to assess sustainability performance (see Table 4). This might be explained by the method of data collection or by the lack of available information.

Jacobs University Bremen (JUB) works with other institutions to promote and develop different projects of sustainable issues (see Table 4) as sustainability is addressed only peripherally in the strategic plan.

In WSB University in Wroclaw, sustainability is addressed through its mission, vision, goals, and strategic plan, and it is considered standard. Nevertheless, it does not seem to formally leverage a network for boosting its sustainability (even though lecturers are involved in many activities of the Baltic University Programme) or its assessment (see Table 4).

Sustainability is a core theme in Regent´s University, UK, as well as Pontifical Catholic University of Rio de Janeiro (PUC-Rio), as it is addressed in their strategic plans (see Appendix A). In Regent´s, the assessment through the Environmental Management System (EMS), certified according to standard 14001, provides international recognition of the university's environmental performance and certification ISO 50001. For their implementation, a consultant was needed as 'these standards cannot be achieved without the co-operation of everyone involved, from the directorate, the academic staff and the students to the gardeners, cleaners,

support contractors, and so on' (Green element 2020). There is no information concerning networks.

On the other hand, PUC-Rio has been coordinating the Environment and Sustainability Network since 2017 for boosting sustainability. The innovation ecosystem at PUC-Rio comprises Instituto Gênesis, which is a start-up and enterprise incubator housed at the university whose aim is to transfer knowledge from the university to society through entrepreneurial initiatives that value social inclusion, improvement in the local quality of life, and the preservation of culture (PUC-Rio 2020). 'Green Living Brasil' is an institute project that aims to develop new sustainable consumption habits that allow for the elimination of negative impacts caused by society on the environment, especially those resulting from the use of disposable plastic packaging and equipment. Additionally, the innovation ecosystem also includes the technology Parks Brasil. Despite all these initiatives, no assessment seems to be made (see Table 4).

At the University of Monterrey there seems to exist an adoption of sustainability, as the mission and strategic plan are standard and the vision and goals are peripheral (see Appendix A). This institution is part of the global community of STARS institutions, belongs to regional sustainability networks and research networks, and is included in an innovation ecosystem though partnership and consulting to incorporate sustainability in the community.

The institutional framework to assess sustainability performance is done internally. The university uses the STARS (AASHE 2020), Global Report Initiative (GRI) assessment tool and performs internal benchmarks (see Table 4). GRI (2020) helps businesses and governments worldwide to understand and communicate their impact on critical sustainability issues, enabling real action to create social, environmental, and economic benefits for everyone.

The GRI mode is used to assess, monitor, and report sustainability with a focus on the academic community, operations, teaching and impact on society, which seems to have some similarities

with the Sustainability Assessment Questionnaire (SAQ) (Farinha 2020), which is an institutional framework that does not seem to be used by any of these ten universities.

At Wake Forest University (WFU), sustainability is addressed peripherally in the mission and goals and standardly through the vision and strategic plan (see Appendix A), where sustainability is explicitly mentioned. The university is part of the global community of STARS institutions, it belongs to regional sustainability networks and research networks, and incorporates an innovation ecosystem through incubators and centres, some of which incorporate sustainability (see appendix A).

The institutional framework to assess sustainability performance is done internally, and ASHE STARS and internal benchmarks are the sustainability assessment tools.

Sustainability is addressed peripherally through the mission, vision, goals, and strategic plan at Massachusetts Institute of Technology (MIT), USA but there is a network for boosting sustainability locally in Cambridge, as well as globally (see Table 2).

The institutional framework to assess sustainability performance is done internally by an Office of Sustainability, whose role is, among others, to develop the Sustainability Tracking, Assessment & Rating System (STARS) report for the Association for the Advancement of Sustainability in Higher Education (AASHE). This report is based on 74 indicators and 5 dimensions (academic, involvement of key actors, operations, planning and administration, innovation and leadership); it is one of the most used tools internationally and is updated annually (AASHE 2020).

According to Lozano et al. (2015), there are important connections between commitment, integration and the signing of a Declarations, Charters or Initiatives that relate to the leverage of values, attitudes, and behaviour within present and future regenerative societies (Lange

Salvia et al. 2019). In the case of the two latter case studies, Wake Forest University and MIT, the peripheral aspect of sustainability in the institutional documents seems to show that the link is not so straightforward.

Table 4 Sustainable Development Network in each University.

	University									
:	**Universidade Lusófona de Humanidades e Tecnologias, Portugal**	**WSB University in Wroclaw, Poland**	**Massachusetts Institute of Technology, Cambridge, Massachusetts, USA**	**Wake Forest University, Winston-Salem, North Carolina, USA**	**Jacobs University Bremen, Germany**	**Pontifical Catholic University of Rio de Janeiro, Brazil**	**Regent's University, England**	**Manipal Academy for Higher Education, , India**	**Vellore Institute of Technology , India**	**University of Monterrey, Mexico**
Network for boosting its sustainability										
Yes (●) / N (-)	-	-	-	-	●	●	●	-	-	●
Which?	-	-	-	-	-			-	-	AASHE. Regional sustainability networks. Research networks.
Innovation ecosystem (technology parks, technology transfer agency, innovation agency, business incubators)										
Yes (●) / N (-)	-	-	●	●	-	●	-	-	-	●
innovation intermediaries boost SD? Yes (●) / N (-)	-	-	-	●	-	●	-	-	-	●
Institutional framework to assess sustainability performance										
Yes (●) / N (-)	-	-	●	●	-	NA	-	-	-	●
Is the assessment performed by external body, internal (self-assessment) or mixed?	-	-	Internal	Internal via Office of Sustainability and its role in developing STARS report for AASHE	-	-	NA	-	-	Internal
which sustainability assessment dimension(s)?	-	-	All as articulated by STARS in AASHE	AASHE STARS and internal benchmarks	-	-	NA	-	-	AASHE STARS and GRI and perform internal benchmarks

NA – not applicable

5. Conclusions

There are differential characteristics between private and public universities regarding their commitment to sustainability, both in internal management aspects as well as in the involvement in their geographical area of influence, the productive sector, or for the promotion of local sustainable development. These differences are mainly related to the type of students and the financing modes of these universities.

Students in private universities tend to have high purchasing power and substantial social capital, which offers them more opportunities to achieve a good professional position after completing their university studies. As a consequence, these students usually end up as influential people in the different working areas in which they practise their profession, whether in government, civil society, for-profit or non-profit. Their capabilities are significant as policy influencers for the promotion of sustainable behaviours.

Regarding funding, private universities are not usually subject to the restrictions that affect public universities. Still, they require a special social assessment as well as professional and academic recognition.

This social assessment and recognition could be measured, among other things, through the success of their graduates and the social perception of its work. This implies that the greater the citizen's awareness of sustainability, the greater the active involvement of the university in favour of sustainable development in particular the teaching scenario on the financial subject.

On the other hand, private universities try to be at the forefront in the teaching and instruction of dynamic students so that they will be very up-to-date in professional activity and closely related to economic and social reality. To achieve this goal, private universities will probably boost the implementation of innovative and sustainable teaching procedures through

incorporating new information technologies that contribute to creating an image of the present-day institution as innovative and sustainable.

Other conclusions which may be drawn from the study are:

- the special features related to sustainable development teaching and research at private universities need to be better identified, in order to involve them more on sustainability efforts;
- also, whereas many of them are highly engaged on improving energy efficiency, reduce greenhouse gas emissions, promote sustainable water usage and promote sustainable landscaping, there is a need for universities to also engage in other areas such as curriculum greening;
- private universities should engage on further efforts to increase their sustainability activities, which are beneficial to them in financial terms, as well as in respect of their image and the greening of their operations.

In this sense, private universities could act as promoting platforms for the so-called ‘green jobs’ in their area of influence, through the training of ‘green-managers’ and ‘green-behavioural’ professionals.

Regarding campus operations policies or actions among the analysed universities, most of them are highly engaged in improving energy efficiency, reducing consumption, reducing GHG emissions, promoting sustainable water usage and promoting sustainable landscaping, because at least 80% of them are actively involved. Along the same lines, 70% are adopting renewable energy sources, a decreased percentage of the analysed universities probably because it takes more time and investments when compared to the other mentioned actions.

Private universities are highly involved in most environmental issues. Nevertheless, the results of this work have shown a fainter engagement in healthcare or the promotion of sustainable food and diet practices, which are also essential for sustainable development. Still, 40% of the analysed universities do not include them in their schedule.

Another important area that has less attention from the analysed private universities is the promotion of green purchasing. The reason for this result could be due to the relatively high purchasing power of the students at private universities, as well as the possibility that they do not perceive the relationship between this issue and sustainable development.

Although the contribution of this work is valuable, it is necessary to point out some limitations, which are mainly related to the primary data. The study is based on a representative and a well-structured sample of ten private universities around the world; however, expanding the sample could reinforce the results of this work.

Since sustainable development is a fundamental goal for all societies, the role played by all institutions, public and private, is also essential. In the case of universities, the commitment to science and innovation goes hand in hand with the commitment to society. This work offers conclusions that may be of help to policymakers for delving into the most notable aspects of the drive for sustainability in private universities, both to help them in their purpose and to take them as an example for public institutions.

Appendix A. Sustainability in Institutional documents in each University.

	University									
:	**Universidade Lusófona de Humanidades e Tecnologias, Portugal**	**WSB University in Wroclaw, Poland**	**Massachusetts Institute of Technology, Cambridge, Massachusetts, USA**	**Wake Forest University, Winston-Salem, North Carolina, USA**	**Jacobs University Bremen, Germany**	**Pontifical Catholic University of Rio de Janeiro, Brazil**	**Regent's University, England**	**Manipal Academy for Higher Education, India**	**Vellore Institute of Technology, India**	**University of Monterrey, Mexico**
Is Sustainability addressed in the Institutional documents										
Mission	-	-	-	-	NA	-	-	NA	-	●
Vision	-	-	-	-	NA	NA		NA	-	●
Goals	-	-	-	-	NA	●	NA	NA	-	●
Strategic Plan	●	-	-	●	●	●	-	●	-	●
How sustainability is addressed in the Institutional documents										
Mission										
-Peripheral	●		●	●						●
-Standard		●		●	NA	-	-	-	●	●
-Core theme										
Vision										
-Peripheral	●		●	●						●
-Standard		●		●	NA	-	-	-	●	
-Core theme										
Goals										
-Peripheral	●		●	●						●
-Standard		●			NA		-	-	●	
-Core theme						●				
Strategic Plan										
-Peripheral	●		●							
-Standard		●		●	●			●	●	●
-Core theme						●	●			

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Figure 1. Methodological procedure followed to design, collect, analyse and report data.

Figure 2. Map of universities (created with Datawrapper).

Figure 3. Number of students in the chosen universities.