

Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour

Jun Cui & Robin Bell

The International Journal of Management Education (2022), 20(2), 100639.

Abstract

This research investigates how entrepreneurial education activity (EEA) influences entrepreneurial behaviour (EB) by unpacking how EEA influences both entrepreneurial intention (EI) and EB and how behavioural entrepreneurial mindset (BEM) mediates the relationship between EEA and EI. This furthers research into the behavioural subdimension of entrepreneurial mindset and how this impacts the relationship between EEA and EI. Confirmatory factor analysis was used for checking the measurement model fit and psychometric properties of the measurement scales used, and structural equation modelling was used for testing the proposed model using questionnaire data collected from 1428 students participating in EEA in higher education institutions in China. The research found that effective EEA has a positive effect on EB which was partly mediated by EI, and that EEA positively affects BEM, which in turn mediates the relationship between EEA and EI. This research contributes by expanding the understanding of how EEA can influence students' EB by highlighting BEM as an impact indicator of entrepreneurship education (EE). Secondly, it contributes to the understanding of the formation of students' EB by identifying how BEM mediates the transition from EEA to EB through the development of EI. This highlights BEM as an effective endogenous driver of students' EI, addressing a lacuna in research by investigating EM from the behavioural perspective in EE research.

Keywords Entrepreneurship education, Entrepreneurial behaviour, Entrepreneurial mindset, Entrepreneurial intention, Behavioural entrepreneurial mindset

1. Introduction

Entrepreneurship is an important indicator of economic growth (Stamboulis & Barlas, 2014) and public policymakers have sought to foster entrepreneurial activity and spirit among youth, to yield financial, cultural, or social benefit (Ho et al., 2018). Consequently, entrepreneurship education (EE) is highly valued in many countries (Rae et al., 2014) and EE programs have rapidly expanded globally within higher education systems (Zaring et al., 2019; Karlidag-Dennis et al., 2020). It is argued that EE can enhance the performance of new ventures, thus contributing to economic development and employment by preparing graduates with the necessary entrepreneurial competences to be successful (Bacigalupo et al., 2016).

Scholars increasingly recognise the significance of university-based EE due to its effectiveness in a range of potential entrepreneurial outcomes. In extant literature, empirical studies suggest that EE, in general, is useful and effective on students' learning outcome including knowledge, skills, perceptions, attitudes, characteristics and psychological capital related to entrepreneurship, and even on graduates' self-employment and job creation (Martin et al., 2013; Nabi et al., 2017; Cui, 2021b). Specifically, research has indicated that EE programs or activities can positively influence the entrepreneurial intention (EI) of students in higher education (Bae et al., 2014; Rauch & Hulsink, 2015; Nowiński et al., 2019; Haddout et al., 2020). This is important because such intentionality can stimulate students' engagement in entrepreneurial activity, for example, opportunity exploration.

However, it seems that the impact indicator of EE is still dominated by EI. Nabi et al. (2017) reviewed 159 EE impact studies and found that most studies focus on subjective impact measures in which 51% addressed EI, while indicators such as venture

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

creation behaviour and business performance only account for 18%. This indicates that few studies have examined entrepreneurial behaviour (EB) as an outcome variable of EE. Existing literature is lacking (Sherkat & Chenari, 2020), partly because EB is a long-term objective indicator requiring suitable measurement method (Rauch & Hulsink, 2015). Yet action or behaviour plays a central role in the entrepreneurial process and scholars emphasized that behaviour is a core construct to understand entrepreneurship (Gartner, 1988; Baron, 2007). In nature, EB is an intentional, self-determined, self-efficacious, and self-identified behaviour based on society and culture (Kirkley, 2016), which can drive an entrepreneur to take action on the opportunity to start a business (Kautonen et al., 2013). Therefore, given the insufficient evidence on the EE impact on EB and its importance in theory (Bell, 2022), we first seek to investigate whether EE directly influences the EB of students in higher education.

Further, there is a paucity of research on the impact indicators related to the intention-behaviour link (Nabi et al., 2017; Martin et al., 2013; Joensuu-Salo et al., 2020; Loan et al., 2021). Although the theory of planned behaviour (TPB) has already expounded that people's behaviour is closely predicted by intentions (Ajzen, 1991) and studies have indicated that self-reported intention can explain start-up behaviour in the entrepreneurship context (e.g., Shirokova et al., 2016), EI does not always translate into behaviours. In some cases, EB occurred without any intention, and students became entrepreneurs even though their EI was very weak (Joensuu-Salo et al., 2020). This indicates little is known about the real intention-behaviour transition (Pittaway & Cope, 2007). In fact, scholars have identified the gap between intentions and actions or behaviours (Kautonen et al., 2015). For example, Adam and Fayolle (2015) suggested that EIs only explain about 30% of the variance in behaviour, thus we need to verify whether EI can drive subsequent behaviour in multiple contexts such as higher education

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

in China. Also, we know little of the bridging function of EI over the transition from EE to EB: Rauch and Hulsink (2015) found that EE affected EI and subsequent EB but Souitaris et al. (2007) did not find such transition. Therefore more research is required to examine whether the impact of EE on students' EI can be turned into EB.

More importantly, extant literature suggests that EE, as an environmental factor, is perceived as an antecedent of EI, mainly based on the theory of human capital and self-efficacy (Maresch et al., 2016). Yet not only external factors (e.g., EE) influence EI, but also internal factors. In terms of the latter, while the three attitudinal predictors (attitude, perceived behavioural control, and perceived social norms) of EI in TPB have been repeatedly confirmed (Liñán & Fayolle, 2015), there may be other EE impact indicators which might substantially explain why EE can increase students' EI, such as entrepreneurial mindset (EM) (Kaffka & Krueger, 2018). EM is beyond intent, broadly referring to ways of adaptable thinking based on changing deep beliefs in uncertain, complex, and dynamic environments (Naumann, 2017). It seems that current studies on EM focus on either cognitive or emotional aspects. For example, Haddoud et al. (2020) investigated some components of EM in the EE-EI link such as passion and optimism, which are emotional aspects of EM. We argue that the behavioural aspect of EM is also important because “The end of all the cognition and motivation of entrepreneurs is to take some action in the world” (Bird & Schjoedt, 2009, p. 327). In other words, without action or behaviour, an entrepreneur would never create a venture. Moreover, researchers are still unclear about the role of behavioural aspects of EM in the transition from EE to EI. Despite its importance, we are surprised by the scarcity of research that addresses EM from the behavioural perspective in the field of EE impact research, thus remaining an under-researched phenomenon requiring further research attention.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

To fill the above research gaps, we not only verify the influence of EE on EI followed by EB, but also explore the role of behavioural aspects of EM in the relationship between EE and EI. Addressing this, we invoke the concept of behavioural entrepreneurial mindset (BEM) defined by Kuratko et al. (2020). EM is usually conceived as a deep cognitive phenomenon as its foundation lies within cognitive adaptability (Haynie et al., 2010). For example, Ireland et al. (2003, p. 968) defined EM as a “way of thinking about business that focuses on and captures benefits of uncertainty”. However, Kuratko et al. (2020) proposed three distinct aspects of EM in triad dimensions: the cognitive aspect relates to how entrepreneurs use mental models to think, the emotional or affective aspect answers what entrepreneurs feel in entrepreneurship, and the behavioural aspect relates to how entrepreneurs engage or act on opportunities (Kuratko et al., 2020, p.2). The behavioural aspect of EM is related with behavioural perspective because this aspect entails a way to behave and act on an opportunity and create a venture (Kuratko et al., 2020, p.5), and that the goal of an entrepreneur is to take actions to generate value creation rather than just thinking and feeling without any behaviour (Bird and & Schjoedt, 2009). Thus the behavioural aspect has inspired research on entrepreneurial action and behaviour (Van Geldren et al., 2018). In our study, we developed the measurement scale of BEM with six dimensions because Kuratko et al.’s construct of BEM is only about its definition and concepts, but not the measurement.

We measure EE by focusing on the engagement in entrepreneurial education activity (EEA) because the impact results of EE on entrepreneurial outcomes are mixed. Although most of the studies have shown that EE exerts positive outcomes, typically of EI (Martin et al., 2013; Bae et al., 2014), researchers have also found no positive, or even negative EE outcomes, on EI, human capital assets, and entrepreneurial performance (Oosterbeek et al., 2010; Mentoor & Friedrich, 2007; Honig & Samulsson, 2012). These

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

equivocal impact results may result from different educational attributes and pedagogy which are likely to substantially explain the controversial outcomes of EE (Nabi et al., 2017). Extracurricular activity is a different type of learning experience compared with formal courses in education and it is under-investigated in EE impact research (Arranz et al., 2017). Cui et al.'s (2021) research has suggested that extracurricular activity has a direct impact on students' entrepreneurial inspiration and cognitive mindsets. Therefore, this study highlights EEA as an independent variable.

The aim of this paper is to investigate the impact of the engagement in EEA on EB by examining the role of both EI and BEM in that impact. In doing so, this research contributes to expanding our understanding of the impact of EE by highlighting BEM as an impact indicator, alongside EI and EB. Secondly, our study contributes to the value-added understanding of internal factors of EI by verifying BEM as an endogenous driver. Thirdly, this study contributes to enhancing our understanding of the transitional function from the engagement in EEA to EB by explaining the mediating role of EI and BEM in a double chain. Finally, we contribute to the understanding of the behavioural aspects of EM by identifying its antecedent (EEA) and consequence (EI).

2. Theoretical hypothesis

2.1 Research framework

TPB explains that “intentions to perform behaviours in specific situations can be predicted with three antecedents (attitudes toward the behaviour, subjective norms, and perceived behavioural control), and that intentions, together with perceived behavioural control, account for considerable variance in actual behaviour” (Ajzen, 1991, p.179). TPB has been validated as a robust and substantial framework across many domains of human behaviour (Ahmed et al., 2020).

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

In our research, we did not use the three factors of intentions in TPB. Firstly, not all studies necessarily adopt the whole TPB framework and the EI-EB link in it requires further investigation. Overwhelming research has applied parts of TPB, mainly focusing on the three antecedents of EI, and confirmed their predictive role in the entrepreneurship context (e.g., Nowiński et al., 2020; Gieure et al., 2020; Doanh, 2021). However, few studies have included the EI-EB link (Martin et al., 2013; Rauch & Hulsink, 2015). Intentions do not always lead to behaviours and “after all, entrepreneurship is about action rather than mere intentions” (Kautonen et al., 2015). These factors inspired us to focus on the relationship between EI and EB in the present study.

Secondly, we wanted to move forward by expanding predictors of EI beyond the traditional antecedents in TPB. Although previous entrepreneurship studies have found that the three antecedents in TPB explain 30-45% of the variation in intentions (Liñán & Chen, 2009), research in EE should not rely solely on drivers of EI in TPB due to the complexity of entrepreneurship process which requires multiple actions and involves various sequences in a dynamic situation (Kautonen et al., 2015). Researchers have made efforts to explore exogenous determinants of EI, for example, EE (Fayolle & Gailly, 2015; Ahmed et al., 2020; Hoang et al., 2021; Cui, 2021a). However, endogenous factors are under-researched (Lortie & Castogiovanni, 2015).

In this study, we integrated BEM into the proposed model for three main reasons. Firstly, BEM is a critical factor relevant to entrepreneurship because it reflects the essence of entrepreneurship. In nature, entrepreneurship centres around opportunity in the dynamic process of vision, change, and creation (Kuratko et al., 2020). Secondly, we are interested in investigating BEM as an impact factor of EEA. Prior research has shown that EE in universities relates to EM (Cui et al., 2021; Hultén and & Tumunbayarova,

2020), suggesting that BEM might be an impact indicator. Thirdly, in our context, as mindset can affect a person’s motivation (Dweck, 1999) and possessing EM equips an individual with ways of doing to act upon opportunity (Benedict and & Venter, 2010), so BEM is likely to be salient and appropriate in understanding the individual antecedent of EI.

As illustrated in Figure 1, the factors that we theorize influence the relationship between EEA and EB include an individual’s mindset and intention. We hypothesize that students’ EB is dependent on the engagement of EEA through the mediating role of EI (H1). Moreover, to understand the role of mindset in the formation of intention, we also investigate the mediating role of BEM in the relationship between EEA and EI (H2).

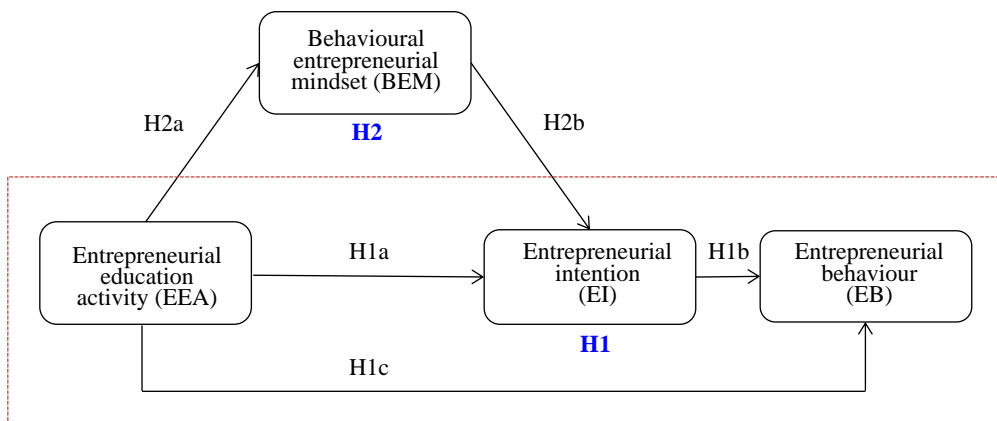


Fig. 1. The theoretical model and hypotheses.

Note: H1 and H2 are hypotheses on mediating effects; H1a-c, H2a-b are hypotheses on direct effects in the model.

2.2 Behavioural entrepreneurial mindset

The EM generally refers to a state of mind that orients human conduct towards entrepreneurial activities and outcomes. The notion of EM is usually considered as a way of thinking based on a cognitive perspective (Naumann, 2017). Furthermore, EM is

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

malleable, and can evolve over time through an individual's interaction with the environment (Mathisen & Arnulf, 2013).

Kuratko et al. (2020) identified three distinct aspects of EM: cognitive, emotional, and behavioural. EM can be understood in terms of thoughts, feelings, and actions, implying thinking, feeling, and action in entrepreneurship process. Some researchers engage in cognitive EM to study the substantive attributes and associated qualities, such as entrepreneurial cognition, cognitive adaptability, motivation, and metacognition (Naumann, 2017; Kuratko et al., 2020). Other scholars adopt the emotional approach to explore what entrepreneurs feel, including both the bright and the dark side of the feeling. The former refers to positive affection such as entrepreneurial inspiration, passion, and dispositional optimism (e.g., Souitaris et al., 2007); the latter is related to negative emotion, entrepreneurial ego, or overconfidence (e.g., Salamouris, 2013), produced during the entrepreneurship process under the situation of risk, uncertainty, and stress. While the cognitive and affective perspectives of EM suggest how entrepreneurs think about a task or an opportunity, and how they feel during the entrepreneurship, it remains less clear how these cognitions and emotions entail a way for entrepreneurs to engage in actual actions or behaviours in entrepreneurship.

In this paper, we focus on BEM, often associated with opportunity, creation, and action (Kuratko et al., 2020). Although there is no clear and consistent definition of BEM, several broad definitions of EM emphasizing individual's entrepreneurial abilities or skills, can represent the concept of BEM because abilities or competences directly lead to action and thus preconditions of behaviours. To understand the behavioural components of EM, we adopt Shepherd et al.'s (2010, p. 62) definition: "ability to rapidly sense, act, and mobilize in response to a judgmental decision under uncertainty about a possible opportunity for gain." In other words, to utilize an opportunity, an individual

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

should adapt to risky and uncertain situations in which to create novel ideas and execute them by means of network, resources, and support from others. It is noted that the literature separates EM from EB, as the former refers to the abilities and general attitude (ways of action) of an individual towards entrepreneurship, while the latter refers to the evident action itself. (Mäkimurto-Koivumaa & Belt, 2016).

Based on extant literature, we conceptualize BEM into six elements: focus yet adapt, creativity, execution, networking, resource leveraging, and mobilizing others, which describe holistically the behavioural aspects of EM at the individual level. These elements can be classified into two types. The former three belong to the internal skills of the individual, which determine the direction of the opportunity identification and utilization, and the latter three belong to the external environment and human resources on which the individual depends and provides the conditions for an individual to behave entrepreneurially. In total, each element is not isolated, but interacts with others, systematically contributing to the components of the construct of BEM at the individual level.

Details of the components of BEM are as follows: First, *focus yet adapt* is defined as focusing on goal achievements while being flexible and self-regulating given uncertain environments (Morris et al., 2013). Future focus means thinking beyond the immediate situation and planning for the future (Lieberman & Trope, 2008). Adapting relates to three stages that are goal orientation, optimum decision, and monitoring (Haynie & Shepherd, 2009). In entrepreneurial contexts, the three stages of adapting are different from cognition and are closer to the behavioural aspects of EM and thus critical to the metacognitive functioning in the process of entrepreneurial action.

Second, *creativity* is defined as the generation and implementation of novel ideas to achieve goals (Amabile, 1997). Creativity is regarded as the ability to connect and

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

generate novel ideas, and to solve problems with curiosity (Bird, 1995). An individual with creativity can adopt different perspectives or try new approaches to tackle problems. Existing literature suggests that creativity is a necessary part of entrepreneurial skills required to venture competitiveness and success. Thus, creativity is fundamental for innovation and successful entrepreneurship in an individual level.

Third, *execution* is defined as the turning of ideas into actionable plans and implementing those ideas well (Davis et al., 2016). By this definition, execution refers to the ability to take a strategy and translate it into tactical action steps. In entrepreneurship context, execution is the main activity in an organization because it influences the performance of the organization (Yang et al., 2019), and affects “how works get done” in a well-defined plan (Sull & Spinosa 2007).

Fourth, *networking* is defined from a social capital perspective. Networking is conceptualized as the structure of individuals’ contact networks interconnecting the various people with whom each person is tied (Raider, 1996). Networking is based on social interaction skills and is about creating and maintaining contacts with people outside. As entrepreneurship is a socio-economic activity, networking becomes an important strategy for individuals to recognise and utilize entrepreneurial opportunity.

Fifth, *resource leveraging* is defined as accessing and exploiting resources that one does not really own or control to obtain one’s goal (Morris et al., 2013). Resources are very important assets in the transformation of a novel idea into action (Davidsson, 2005). However, because it is impossible and unnecessary for people to possess and control all the resources, entrepreneurs need to have the ability to use the existing resources of others or introduce resources at low cost (Politis et al., 2011). Therefore, we believe that an individual's thinking and ability in resource acquisition reflect the essential

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

characteristics of entrepreneurial action, and thus an important part of the EM from the perspective of behaviour.

Finally, *mobilizing others* is defined as inspiring and persuading others by effective communication based on facts (EC, 2012). Entrepreneurship is a teamwork activity that not only relies on the leader but also on the people from both the internal team (e.g., employees) and external stakeholders (e.g., suppliers). Mobilizing others, suppliers for example, is essential for the development of new ventures because they potentially enhance the capacity to create value (Rocca & Snehota, 2020). This implies that mobilizing others is a kind of human resource and necessary to be a component of BEM.

2.3 Entrepreneurial education activity and entrepreneurial behaviour through entrepreneurial intention

The factors influencing EI may be external or internal to the individual (Lee et al., 2011). With external factors, EE is regarded as an external or environmental motivator of EI (e.g., Franke & Lüthje, 2004). In literature, EE is positively related to EI mainly based on two theoretical groundings: human capital theory and entrepreneurial self-efficacy. The former argues that EE is a kind of human capital investment in knowledge and skills which may increase the EI of students (Bae et al., 2014). The latter holds that EE could trigger entrepreneurial self-efficacy which may enhance an individual's EI and be a positive mediator of the EE-EI link (Zhao et al., 2005). Recent studies confirm the indirect effect of EE or perceived educational support on EI through entrepreneurial self-efficacy (Nowiński et al., 2019; Wegner et al., 2020). In the context of China, scholars have found that EE has a positive impact on the EI of students in higher education institutions (Dou et al., 2019; Sun et al., 2017). Since EEA is one of the important components of EE

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

(Gielnic et al., 2015), we propose the following hypothesis:

H1a: Entrepreneurial education activity (EEA) is positively related to entrepreneurial intention (EI) among students in higher education.

TPB is particularly useful for understanding the relationship between EI and EB. According to TPB, a behaviour is best explained by an intention towards the specific behaviour (Ajzen, 1991). The theory has been widely applied to the context of entrepreneurship because EB is planned and intentional under volitional control (Kirkley, 2016). EB is a consequence of the EI of students because the strength of intention reflects the willingness to invest actions and can affect the individual's subsequent behaviour (Gielnic et al., 2015). Prior empirical studies in entrepreneurship support EI serving as a key antecedent of EB. For example, EI explained EB both after one to three years and after six to eight years, suggesting EI is a stable antecedent of EB (Joensuu-Salo et al., 2020). This leads to the following hypothesis:

H1b: EI is positively related to entrepreneurial behaviour (EB) among students in higher education.

The relationship between EE and EB can be explained by human capital theory that predicts knowledge, skills, and other competences (capital assets) can yield better performance in behaviour (Ployhart & Moliterno, 2011). This means that student acquired human capital assets from EE (capital investment), in turn entails them abilities to engage in EBs. In EE research, TPB provides a good framework for explaining the impact of EE on EB since EE influences the predictors of EI and should also increase the subsequent behaviour (Fayolle & Gailly, 2006). EE can lead to entrepreneurial action due to the stimulation and augmentation of students' behavioural intention (Liñán, 2008). Rauch

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

and Hulsink's (2015) study, using a quasi-experimental design, confirmed that not only university EE programs positively impact students' EB, but also the effect of EE on EB is mediated by the intention of students. This suggests the following hypotheses:

H1c: EEA is positively related to EB among students in higher education.

H1: EI mediates the positive relationship between EEA and EB among students in higher education.

2.4 Entrepreneurial education activity and entrepreneurial intention through behavioural entrepreneurial mindset

Human beings' mindset evolves over time and is formed as a product of our histories in the process of interactivity (Gupta & Govindrarajam, 2002). Literature shows that EM is an impact indicator of EE beyond EI (Nabi et al., 2017; Cui et al., 2021). In contrast to cognitive EM, behavioural EM reveals ways of doing or actions, including special abilities or skills. Such skills are malleable to some extent and can arise from EE (Davis et al., 2016). There is evidence for the positive impact of EE on the components of BEM. For example, Lackeus (2020) confirmed that experiential entrepreneurial education approaches can trigger learning events which in turn affect students' learning outcomes of competencies, such as initiative-taking, subject matter skills, and perseverance. A European Commission study (EC, 2012) found that entrepreneurship programs in higher education impact students' skills of adaptability, creativity, networking and motivating others which were included as part of elements of BEM in the present study. Therefore, we propose that:

H2a: Entrepreneurial education activity (EEA) is positively related to behavioural entrepreneurial mindset (BEM) among students in higher education.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

A mindset reflects the implicit intellectual abilities of a person and does affect an individual's motivation (Dweck, 1999). In this vein, entrepreneurial mindset may exert impact on the intentions of students towards entrepreneurship. Furthermore, the behavioural aspects of EM represent the ways of doing with which an entrepreneurial person takes actions to create value in real entrepreneurial situations (Kuratko et al., 2020). This implies that an individual who possesses BEM has a better understanding and capabilities of entrepreneurial action, so the individual is more likely to engage in entrepreneurial activities. Therefore, the BEM should influence EI. Empirical results support the links between BEM and EI. For example, individual creativity or innovation as an element of BEM positively relates to EI of students in universities (Wegner et al., 2020; Shahab et al., 2019). Based on the above reasoning and empirical evidence, we propose the following:

H2b: BEM is positively related to EI among students in higher education.

EM can be driven by past and current experiences, such as education and learning (Gupta & Govindrarajam, 2002). Based on this, BEM can be shaped and enhanced through a certain kind of education and enough training because mind-shift changes can be formed through entrepreneurial learning (Gibb, 2002). The link of EEA with BEM could be explained broadly by Social Cognitive Theory in which environmental factors affect personal and behavioural variables (Bandura, 2001). In turn, BEM could affect EI. This is because that, besides external drivers, internal or endogenous factors such as individuals' attitude and mindset also importantly influence EI (Franke & Lüthje, 2004; Guerrero et al., 2018). Studies have indicated that EM is an influencing antecedent of EI (Wach & Wojciechowski, 2016). The above evidence supports that BEM is very likely to play a role in transferring the effect from EE to EI. In our study, verification of H2a

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

and H2b could show a mediating effect of BEM in the relationship between EEA and EI.

Consequently, it is proposed that:

H2: BEM mediates the relationship between EEA and EI among students in higher education.

3. Methods

3.1 Sample and data collection

To test the hypotheses, a stratified purposeful sampling method was adopted to collect data from 15 higher education institutions in Jiangsu province. Jiangsu was chosen as the province has implemented an enterprise and EE strategy in colleges and universities to promote regional innovation and entrepreneurship. The inclusion criteria of the sample were that sampling institutions were representative in the types of education offered and the institutions provided EE across the campus. The chosen institutions offered not only entrepreneurial courses with regular 2 credits and one-term length, optional or compulsory, but also extra-curricular activities that the students were exposed to. Overall, there were various forms of extra-curricular activities, including entrepreneurship clubs, entrepreneurship design competitions at the university, provincial and national levels, enterprise visits, or internships, face-to-face communication with an entrepreneur, entrepreneurial incubation projects, and business simulators or workshops.

There was a target of 150 samples per institution, and the total target number of samples was 2250. Finally, a total of 1428 valid responses were produced, representing a response rate of 63.47%. Among the 1428 valid samples, 50.70% were women and 49.30% were men; 96.20% of students were aged between 18 to 23, 1.60% were under 18, and 2.20% were above 23; the proportion of students from year-one was 40.60%,

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

year-two 36.50%, year-three 18.50%, and year-four 4.40%; the distribution of majors was 56.50% science and engineering, and 43.50% humanity and social sciences.

The research was granted ethical approval and followed institutional ethical guidelines including informed consent and anonymity. In terms of the procedure of the data collection, we firstly informed the responsible person selected in each institution of the requirements of the sampling, that data could be collected from across at least three disciplines covering four year groups. Then we offered a website link for conducting the online questionnaire survey. During the process, we communicated again with coordinators to keep abreast of the completion of the questionnaires by participants. Finally, we closed the survey website and downloaded the data at the end of survey period.

3.2 Measures

The research operationalised existing scales to measure the theoretical concepts. To minimize method biases and ensure the validity and reliability of the data, the scales were double-back translated from English to Chinese by two bilingual academics. The questionnaire was pilot tested by 20 students and 5 of the participants were interviewed to ensure the clarity and validity of the questionnaire. Finally, the anonymity and data confidentiality of the data collected was guaranteed.

3.2.1 Dependent variable

EB was measured using scales adapted from Rauch and Hulsink (2015). Three “yes” or “no” binary questions were utilized to capture the depth and breadth of university students’ EB. The first question asked whether the participant had established their own business. If “Yes” then scored 5; “no” jumped into the second question: “Are you, alone or with others, currently trying to start a new business, including any self-employment, online

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

retailing or selling any goods or services to others?”. If “Yes” then scored 4, “no” jumped into the third question: “Even though you currently may not be starting a venture, have you engaged in any behaviour in entrepreneurship in the last year?” We provided a list of 18 behaviours (e.g., saving money to invest in a business, started marketing or promotional activities, see Appendix) toward venture creation, scoring 1 for selecting 1-6 behaviours, 2 for 7-12 behaviours, and 3 for above 12 behaviours. If the student chose ‘nothing at all’, it was scored 0. These scores produced a final scale score for each participant for the transformative variable of EB within the range from 0 to 5, indicating their degree of the involvement in EB.

3.2.2 Independent variable

The engagement in EEA was measured using a scale taken from Arranz et al.’s (2017) study. We used ten items to capture both the extensiveness of students’ engagement on EEA and the extent of their benefit from EEA. Sample activities included “entrepreneurship clubs”, “entrepreneurship design competitions”, “face-to-face communication with an entrepreneur”, see Appendix. We combined two progressive questions into a single scale as used by Souitaris et al. (2007) to measure participants perceived benefit of the engagement in EEA. Participants were firstly asked which of the activities they had been involved in. If “No” then scored 0; If “yes” they scored 1 and students were further asked to recognize the extent of the benefit from each selected activity on a 7-point Likert scale. The score of each item was the product of the scores of two questions, and the final score of the variable EEA was the average score of 10 items.

3.2.3 Mediating variables

BEM was operationalized with six subdimensions taken from existing scales, namely

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

focus yet adapt (Haynie & Shepherd, 2009), creativity (Tierney et al., 1999), execution (Davis et al., 2016), networking (Forret & Dougherty, 2001), resource leveraging (Winborg & Landström, 2000) and mobilizing others (EC, 2012). The items within the subdimensions were adapted to situate within the context of Chinese higher education institutions. Consequently, the variable of BEM was measured by 22 items on a 7-point Likert scale (1= completely disagree, 7= completely agree). Respondents were asked to state the extent to which they agreed with statements on each item. A sample item was 'I am focused on the long term'. The variable was computed as an average score of each item.

EI was measured using Liñán and Chen's (2009) well-established scale consisting of six items where participants were asked to evaluate their level of agreement with each statement. A sample statement was 'I am ready to do anything to be an entrepreneur'. The answer was on a 7-point Likert scale from 1 (completely disagree) to 7 (completely agree). The variable of EI was computed as an average score of each item.

3.2.4 Control variables

Five control variables were incorporated into the research design. From the personal aspect, *gender* was controlled as it has been found to influence EI (Hahn et al., 2017). Previous research has found that the initial state of EI of university students played a role in the development of their EI and suggested a potential controller (Fayolle & Gailly, 2015). Accordingly, students' initial state of EM may affect the formation of EM by EE and existing literature has applied the initial state of EM as a control in EE impact research (Cui et al., 2021; Cui, 2021a). Therefore, the *initial level of entrepreneurial intention* (IEI) and the *initial level of entrepreneurial mindset* (IEM) were controlled using a 7-point scale from 1 (very low level) to 7 (very high level). From an educational aspect,

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

institution type and *entrepreneurial course attendance* were controlled as previous studies have indicated that they may impact the outcome of EE (Nabi et al., 2017). Institution type (general or vocational-oriented) and course attendance (not attended or have attended) were both dichotomous variables.

3.3 Data analysis

The data was analysed using SPSS 24 and MPLUS 7 to conduct exploratory factor analysis (EFA), confirmatory factor analysis (CFA), structural equation modelling (SEM) and hypothesis testing.

3.3.1 Assessment of the measurement model

CFA was employed to validate the scales. The loadings of each item on their respective constructs were all above 0.60 which is recommended for scale development (Anderson & Gerbing, 1988), apart from one item at 0.54 that was deleted. The loadings then exceeded 0.60 ranging from 0.66 to 0.92, most were above 0.70.

We assessed the reliability of the measurement model by Cronbach's alpha (α) and composite reliability (CR). All the values of α were above 0.90 confirming the internal consistency of the scales. CRs for each construct also exceeded 0.90 indicating high reliability of the scales (Lance et al., 2006). With convergent validity, all AVE values exceeded the acceptable level of 0.50 (Bagozzi et al., 1991) indicating convergent validity. In terms of discriminant validity, it was evaluated by comparing the square roots of AVE. For each construct, the square root of the AVE was higher than the correlations ranging from between the given construct and the other constructs in the model, meeting the criterion for discriminant validity (Fornell & Larcker, 1981). Table 1 presents the measurement model index.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

Descriptive statistics and correlations for key variables are also displayed in Table 1. The correlations among four research variables are significantly ($p < 0.01$) related with relatively low value of correlation ranging from 0.12 to 0.51, providing evidence that these constructs are distinct and independent (Whiteside & Lynam, 2001).

CFA was used to test the fit of the measurement model. We split BEM into six factors to test the validity of the sub-construct measurements. The fit of the separate six factors of BEM was excellent (CFI=0.97, TLI=0.97, RMSEA=0.05[0.05,0.06], SRMR=0.02). Table 2 presents the fitness of the whole measurement model. We can see that the fitness of the one-factor model is significantly worse, yet the eight-factor model was better than other constraining models with satisfactory model fit indices (CFI=0.95, TLI=0.95, RMSEA=0.05[0.05,0.05], SRMR=0.03). This indicates that the latent variables in the proposed model represent different constructs which further confirms an adequate discriminant validity.

Table 1

Reliability and validity index, descriptive statistics and correlations.

Variable	α	CR	AVE	Mean	SD	1	2	3	4	5	6	7	8	9
1. EB				1.39	1.77	N.A.								
2. EEA	0.94	0.94	0.63	2.90	1.82	0.20**	0.79							
3. BEM	0.97	0.97	0.58	4.45	1.10	0.12**	0.36**	0.76						
4. EI	0.96	0.96	0.79	3.80	1.59	0.28**	0.39**	0.51**	0.89					
5. Gender				1.51	0.50	-0.14**	-0.10**	-0.06*	-0.27**	N.A.				
6. IEI				3.76	1.84	0.26**	0.28**	0.35**	0.63**	-0.24**	N.A.			
7. IEM				3.22	1.60	0.27**	0.34**	0.35**	0.56**	-0.21**	0.65**	N.A.		
8. Institution				1.35	0.48	0.12**	0.15**	0.03	0.27**	-0.24**	0.24**	0.24**	N.A.	
9. Course				0.52	0.50	0.09**	0.29**	0.07**	0.18**	-0.04	0.12**	0.13**	0.16**	N.A.

Note: n=1428. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

EB entrepreneurial behaviour, **EEA** entrepreneurial education activity, **BEM** behavioural entrepreneurial mindset, **EI** entrepreneurial intention, **IEI** initial entrepreneurial intention, **IEM** initial entrepreneurial mindset; Gender, IEI, IEM, institution, and course are control variables; α Cronbach's alpha, **CR** composite reliability, **AVE** average variance extracted, **SD** standard deviation. The diagonal values (in bold) are the square root of corresponding AVE, and the values on triangle elements are correlations among the variables. We did not compute α , CR and AVE of EB because it is not a standard latent variable but a transforming one.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

Common method variance (CMV) was tested for in multiple ways. Harman's single factor test (Harman, 1967) was used in EFA and found that the single factor (40.89%) was below the threshold value of 50%. An unmeasured common latent method factor technique was then adopted to test CMV in CFA (Podsakoff et al. 2003) which is commonly used in entrepreneurship research (e.g., Wiklund et al., 2017). After adding a common factor in our measurement model, the model fit did not improve significantly ($\Delta\text{CFI}=0.00$, $\Delta\text{TLI}=0.01$, $\Delta\text{RMSEA}=0.00$, $\Delta\text{SRMR}=0.02$). These results indicate that CMV should not be a serious problem in our measure.

Moreover, concerns of common method bias were reduced through additional procedural remedies suggested by Cooper et al. (2020). Participants were assured that their responses were anonymous and strictly confidential. Different response formats were adopted and questions were concise and easily readable, only items adapted from mature scales were used, a double-back translation strategy was adopted, and improved wording of the questionnaire was achieved through a pilot survey and interviews. Concerns over social desirability answering was reduced by disrupting the routine order of questions to prevent anticipation and adaption of the answers of respondents.

In addition, the variance inflation factor (VIF) was computed to test multicollinearity in the regression results. The scores of all VIFs ranged from 1.23 to 1.441, and fell below the threshold value of 2, indicating that we did not encounter multicollinearity problems in the models (Kutner et al., 2004).

Table 2

Model fit indices for measurement model.

Model	χ^2	df	χ^2/df	$\frac{\Delta \chi^2}{df}$	CFI	TLI	RMSEA	SRMR
One factor	21306.26	629	33.84	—	0.56	0.53	0.15[0.15,0.15]	0.15
Two factors	12494.43	628	19.90	13.95	0.75	0.73	0.12[0.11,0.12]	0.09
Three factors	5325.42	626	8.51	11.39	0.90	0.89	0.07[0.07,0.07]	0.05
Four factors	4704.47	623	7.551	0.96	0.91	0.91	0.07[0.07,0.07]	0.04
Five factors	4009.97	619	6.48	1.07	0.93	0.92	0.06[0.06,0.06]	0.04
Six factors	3226.72	614	5.26	1.22	0.94	0.94	0.06[0.05,0.06]	0.06
Seven factors	3001.73	608	4.94	0.32	0.95	0.94	0.05[0.05,0.05]	0.03
Eight factors	2844.14	601	4.73	0.21	0.95	0.95	0.05[0.05,0.05]	0.03
Nine factors	3002.21	592	5.07	0.34	0.95	0.94	0.05[0.05,0.06]	0.05

Note: *EEA* entrepreneurship education activity, *EI* entrepreneurial intention. Six sub-constructs of behavioural entrepreneurial mindset: *BEM1* focus yet adapt, *BEM2* creativity, *BEM3* execution, *BEM4* networking, *BEM5* resource leveraging, and *BEM6* mobilizing others. *CMV* common method variance. The dependent variable of entrepreneurial behaviour is not included in the measurement model because it is not a standard latent variable but a transforming one.

3.3.2 The structure model

SEM with the maximum likelihood estimation was used to test the proposed hypotheses. The transformed variable of EB was used in our structure model and all the hypotheses were tested in a single model including five control variables. The SEM model had satisfactory fit indices (CFI=0.94, TLI=0.93, RMSEA=0.05[0.05,0.05], SRMR=0.08). The path coefficients and their significances are summarized in Figure 2.

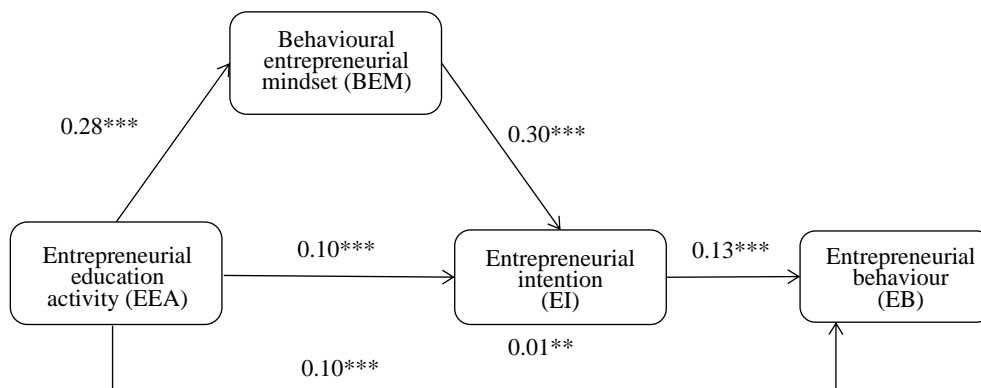


Fig. 2. Statistical coefficients and significance of the structure model.

Note: Control variables are gender, institution type, and entrepreneurial course attendance.

4. Results

The direct effects between EEA, EI, and EB were first tested, corresponding to hypotheses H1a, H1b, and H1c. In Table 3, among the control variables, five control variables significantly influence EI while the influence of gender is negative. There is also a positive influence of IEM on EB, but the other four controls do not have significant influence on it. The direct effect of EEA is positive and significant on EI ($\beta=0.10$, $p<0.001$) and EB ($\beta=0.10$, $p<0.001$), and the effect of EI on EB is also positive and significant ($\beta=0.13$, $p<0.001$). Therefore, H1a, H1b, and H1c are supported.

The indirect effect of EI was then tested. The results are shown in Table 4. The indirect effect of EI from EEA to EB is positively significant ($\beta=0.01$, $p<0.01$) and the bootstrapping confidences are significant ([0.01, 0.02]). Because the direct effect of EEA to EI, EI to EB, and EEA to EB are also all positively significant, H1 was supported. This demonstrated that EI partly mediates the relationship between EEA and EB.

Table 3

Results of direct effect from entrepreneurial education activity to entrepreneurial behaviour.

DV	BEM		EI		EB	
	Estimate	S. E.	Estimate	S. E.	Estimate	S. E.
<i>Intercept</i>	3.40	0.14	0.04	0.18	0.16	0.03
Gender	0.02	0.03	-0.12***	0.02	-0.05	0.03
IEI	0.20***	0.04	0.39***	0.03	0.06	0.04
IEM	0.17***	0.04	0.14***	0.03	0.11**	0.04
Institution	-0.10***	0.03	0.11***	0.02	0.02	0.03
Course	-0.03	0.03	0.06**	0.02	0.01	0.03
EEA→BEM/EI/EB	0.28***	0.03	0.10***	0.02	0.10***	0.03
BEM→EI			0.30***	0.03		
EI→EB					0.13***	0.04
F-value	66.19***		251.12***		24.72***	
Adjusted R ²	0.22		0.55		0.10	
Significance	0.00		0.00		0.00	

Note: The full variable names are in Table 1. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4

Results of mediation test of behavioural entrepreneurial mindset and entrepreneurial intention.

DV	EB			EI		
	Estimate	S. E.	95% confidence interval	Estimate	S. E.	95% confidence interval
EEA→EI→EB	0.01**	0.01	[0.01, 0.02]			
EEA→BEM→EI				0.08***	0.01	[0.07, 0.10]
EEA→BEM→EI→EB	0.01**	0.00	[0.01, 0.02]			
EEA→EB (c)	0.12***	0.03	[0.07, 0.18]			
EEA→EB (c')	0.10***	0.03	[0.23, 0.34]			
EEA→BEM+EI→EB (ab)	0.02**	0.01	[0.01, 0.04]			

Note: The full variable names are in Table 1. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Similarly, the direct effects between EEA, BEM, and EI were tested, corresponding to hypotheses H2a and H2b. In Table 3, among the control variables, it is noted that initial level of EI and EM have positive and significant influences on BEM, and that institution type has negative and significant influences on it. The direct effect of EEA is significantly positive on BEM ($\beta=0.28$, $p<0.001$), and the effect of BEM on EI is also significantly positive ($\beta=0.30$, $p<0.001$). Therefore, H2a and H2b are supported.

The indirect effect of BEM was then tested. Results in Table 4 show that the indirect effect of BEM from EEA to EI is positively significant ($\beta=0.08$, $p<0.001$) and the bootstrapping confidences are also significant ([0.07, 0.10]). Because the direct effect of EEA to BEM, BEM to EI, and EEA to EI are also all positively significant, it demonstrates that BEM partly mediates the relationship between EEA and EI, and that H2 is supported.

The indirect effect sizes are then reported. In Table 4, all the indirect effects are positively significant. In terms of effect size for the path from EEA to EB, the size of total effect (0.12) is the sum of direct effect (0.10) and total indirect effect (0.02), suggesting that EI and BEM together contributes 19.51% (ab/c) for the total effect on the EEA-EB path. The total indirect effect (0.02) is equal to the indirect effect of EI (0.01) plus the

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

indirect effect of BEM-EI (0.01). This means that EI independently accounted for 54.17% of the total mediating effect, BEM and EI jointly accounted for 45.83% of the total mediating effect. Locally, for the path from EEA to EI, the size of total effect (0.19, not presented in Table 4) is the sum of direct effect (0.10, in Table 3) and the indirect effect of BEM (0.08), suggesting BEM contributes 45.41% for the total effect in the EEA-EI path.

Finally, the research model was tested piecewise. EI was added first as a mediator to test the effect on the relationship between EEA on EB as a separate model. Then BEM was added as a mediator in the partial effect of EEA on EI to generate another separate model, conducting two separate analyses instead of one combined analysis. The two separate results are identical for our hypothesis tests, indicating that our findings are robust.

5. Discussion

This study builds on previous research and moves our understanding of the EEA, EI, EB relationship forward by highlighting the cognition of BEM, which has theoretical implications for both TPB and BEM. Although available evidence indicated that intentions do not always lead to behaviour in entrepreneurial processes (Kautonen et al., 2015), our results indicate that EI is a positive predictor of EB. Apart from EI, EB is very likely to be affected by exogenous (environmental) factors such as entrepreneurship education (Fayolle, 2006). These results suggest that EEA might stimulate not only intention but also behaviour. Thus, this study supports the TPB framework in that it can be applied in the context of higher education to explain how EEA affects students' EB through their intention.

Our use of BEM literature to understand intentional response to EEA shows the

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

importance of mindful interpretations of EI for the outcome of EEA. Similar findings have been found in the entrepreneurship literature where entrepreneurship education affects creativity (e.g., Shahab et al., 2019), and entrepreneurial resources and networks affect intentions (Tomy & Pardede, 2020). Since creativity, resourcing and networking are important components of behaviour, these findings support our use of the BEM construct. What is more profound in our findings is that, although the single mediation effect of EI partly contributes to EB, the joint mediation effect of both BEM and EI also contribute to the formation of behaviour. This reveals a double chain intermediary function that is quite novel in existing literature. Therefore, by developing a relatively new construct of BEM, our research model enabled us to explain how BEM can facilitate the relationship between students' engagement with EEA and their EI and subsequent EB.

The study highlights the importance of BEM in theory development. We conceptualized and measured BEM using six sub-constructs, namely focus yet adapt, creativity, execution, resource leveraging, networking, and mobilizing others, which are cooperatively interrelated to represent the behavioural aspects of entrepreneurial mindset. Although previous studies have verified the link between entrepreneurship education and EI based on the theory of self-efficacy and human capital (Bae et al., 2014; Martin et al., 2013), there might be other antecedents of intention related to mindset. Our findings demonstrate that BEM is an important mediator underlying the relationship between EEA and EI. We thus contribute to the entrepreneurial mindset literature by providing an alternative explanation (behavioural perspective) for the positive effects of entrepreneurship education, and further an insightful understanding on the mindful outcome of entrepreneurship education (antecedent) and the mindful trigger of EI (consequent). Therefore, the conceptualization of BEM in this study is valuable in explaining how such mindsets work.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

The research findings also have practical implications for entrepreneurship education in higher education. First, the promotion of entrepreneurship and its education, which is a key issue on policy agendas in many countries, should be enhanced. In China, although entrepreneurship education is widespread in universities under the social, spatial, and institutional context in entrepreneurship, there are still many issues, for example, the lack of curriculum responsiveness to local community and sustainability, the lack of cooperation among stakeholders (Mei & Symaco, 2022), and the lack of the linkage of taught content to practical activities (Bell, 2020). Our findings suggest that EEA has a positive impact on EI and the following behaviour of students in higher education. This speaks to the implementation of entrepreneurship education across different majors on the agenda of higher education policy. Accordingly, entrepreneurial curriculum developers should design and deliver effective educational activities, adopting constructivist active and experiential approaches (Bell & Liu, 2019), to increase students' willingness to engage in EB, such as entrepreneurial clubs, entrepreneurship design competitions, face-to-face communication with entrepreneurs, and entrepreneurial incubation projects.

Next, our findings also show that BEM is an impact indicator of EEA and plays a mediating role in the formation of EI of university students. This speaks to the importance of entrepreneurial mindset from the behavioural perspective. Thus, entrepreneurship educators should pay more attention to outcome-oriented teaching. In other words, it would seem beneficial to integrate BEM (i.e., focus yet adapt, creativity, execution, networking, resource leveraging, and mobilizing others) into the expected learning outcome of entrepreneurial curricula and then be educated effectively. By doing so, higher entrepreneurship education could better prepare students with entrepreneurial mindset profiles.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

Finally, this study may enlighten education policymakers and programme evaluators to optimize the indicators of the effectiveness assessment of entrepreneurship education. Traditionally, the impact indicator of entrepreneurship education was dominated by the EI (Nabi et al., 2017). Although EI reflects the endogeneity of individual students, it does not necessarily point to EB in the indicators of educational evaluation. Therefore, we need to include EB to varying degrees by students on campus as an evaluation index. More importantly, this study found that BEM plays an important role in the relationship between entrepreneurship education and the intentions of students. Indeed, entrepreneurial mindset is an endogenous benefit from entrepreneurship education ahead of the intention. In a sense, entrepreneurship education as a general education has an impact on students' in-plant mindset which is more valuable short term than on their intention and behaviour that are relatively distant. This enlightens us in the scientific indicators of the effectiveness assessment in entrepreneurship education, including not only the distant proxy (EB) and the medium-distance index (EI), but also the proximal indicator such as BEM suggested in this study.

6. Conclusion

This research sought to determine how EEA influences EB by unpacking how EEA influences both EI and behaviour, and how BEM impacts those links. The results highlight both a direct and indirect effect of EEA on EB via the intention and BEM. The research found that effective EEA has a positive effect on EB which was partly mediated by EI; that EEA positively affects BEM which in turn affects the intention; and that BEM mediates in part the relationship between EEA and EI. These empirical findings contribute to the existing literature in several ways.

First, we broaden the impact type of entrepreneurship education by confirming BEM as a novel impact indicator. Understanding BEM is particularly important because it entails a way to behave and act on an opportunity and create a venture (Kuratko et al., 2020). This new impact factor extends prior research dominated by EI (Nabi et al., 2017) and provides a mindset explanation for the impact of education, contributing to the literature on entrepreneurship education.

Second, we expand upon the drivers of EI by verifying the predictive role of endogenous BEM. Our findings indicate that BEM is an important internal factor influencing EI in the Chinese higher education context. This provides a counterweight to the extensive work on external antecedents and thus contributes to the literature on EI (Vuorio et al., 2018; Hueso et al., 2020).

Third, our research highlights the mechanism by which EEA influences EB. Synthesizing our observations on the direct effect of EEA on EB as well as the indirect effect of both EI and BEM, our findings reveal a non-obvious nature of the development of EB, that is the relationship between EEA and EB is mediated by the intention, and in turn, simultaneously mediated by BEM. Thus, we contribute to the entrepreneurship literature by providing a nuanced understanding of the dynamic and transitional function turning EEA into students' EI and the subsequent behaviour in higher education situations.

Fourth, we contribute to the literature on entrepreneurial mindset by shedding light on its behavioural aspects through conceptualization, operationalization, and verification with EEA as its antecedent factor and EI as its consequence variable.

As in all papers, our study has several limitations that provide avenues for future research. Firstly, we used a cross-sectional survey design to collect the data. Survey designs are acceptable and allow for studying the possible relationship and effect of various variables with different groups in a natural education situation especially when

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

examining individuals as the units of analysis (Maula & Stam, 2020); however, it has shortcomings on causal inference. Future research could conduct a quasi-experimental or longitudinal design to explain more precisely the impact of a specific curriculum of entrepreneurship education on its outcomes such as the behaviours of students.

Secondly, the results of this study were based on a sample from students in higher education within a single context, a province in China. We set control variables to account for initial differences of the sample. We also chose students from different majors and grades in a range of institutions to reduce individual and institutional bias. Despite these precautions, future research would benefit from replication using wider samples across other provinces in China and even other countries to explain regional differences (Huang et al., 2020), allowing for more generalizability and external validity of the findings. Thirdly, whilst five variables including gender were controlled in this study, other factors could be considered in future research. Although, some factors such as age and professional experience are likely to be similar in our sample, future research could consider the influence of these along with factors such as socioeconomic background. Finally, the theoretical implications of our study also provide opportunities for further research. This study addressed entrepreneurial mindset in behavioural aspects as a mediator which brings a new insight to both the impact of entrepreneurship education and the formation of EI and succedent behaviour. To further understand the role of entrepreneurial mindset, other perspectives, for example, the emotional aspects of mindset such as entrepreneurial passion (Kuratko et al., 2020; Lackéus, 2020), can be examined to verify whether such mindsets have a positive effect on the EB of university students.

Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)

References

- Adam, A., & Fayolle, A. (2015). Bridging the entrepreneurial intention-behaviour gap: The role of commitment and implementation intention. *International Journal of Entrepreneurship and Small Business*, 25(1), 49-57.
- Ahmed, T., Chandran, V.G.R., Klobas, J.E., & Liñán, F., et al. (2020). Entrepreneurship education programmes: How learning, inspiration and resources affect intentions for new venture creation in a developing economy. *International Journal of Management Education*, 18, 1-13.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Amabile, T. M. (1997). Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review*, 40(1), 39-58.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423.
- Arranz, N., Ubierna, F., Arroyabe, M. F., Perez, C., & Fdez, J. C. (2017). The effect of curricular and extracurricular activities on university students' entrepreneurial intention and competences. *Studies in Higher Education*, 42(11), 1979-2008.
- Bacigalupo, M., Kamyliis, P., Punie, Y., & Van den Brande, G. (2016). *EntreComp: The entrepreneurship competence framework*, Luxembourg: Publication Office of the European Union.
- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship Theory & Practice*, 38(2), 217-254.
- Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly*, 36(3), 421-458.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Baron, R. A. (2007). Behavioral and cognitive factors in entrepreneurship: Entrepreneurs as the active element in new venture creation. *Strategic Entrepreneurship Journal*, 1, 167-182.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Bell, R. (2020). Adapting to constructivist approaches to entrepreneurship education in the Chinese classroom. *Studies in Higher Education*, 45(8), 1694-1710.
- Bell, R. (2022). Developing entrepreneurial behaviours in the Chinese classroom through value creation pedagogy. *Innovations in Education and Teaching International*, 59(1), 37-48.
- Bell, R., & Liu, P. (2019). Educator challenges in the development and delivery of constructivist active and experiential entrepreneurship classrooms in Chinese vocational higher education. *Journal of Small Business and Enterprise Development*, 26(3), 209-227.
- Benedict, E. A., & Venter, P. F. (2010). Education, entrepreneurial mindset and innovation: Necessary ingredients for increasing entrepreneurial activity in South Africa. *International Journal of Entrepreneurship and Innovation Management*, 11(2), 239-253.
- Bird, B. (1995). Toward a Theory of Entrepreneurial Competency. In Katz, J. A., & Brockhaus, R. H. Sr. (Eds). *Advances in Entrepreneurship, Firm Emergence, and Growth*, Greenwich. CN: JAI Press, 2, 51-72.
- Bird, B., & Schjoedt, L. (2009). Entrepreneurial behavior: Its nature, scope, recent research, and agenda for future research. In Carsrud, A. L., & Brannback, M. (Eds.). *Understanding the Entrepreneurial Mind*. New York: Springer, 327-358.
- Cooper B., Eva, N., Fazlelahi, F. Z., & Newman, A., et al. (2020). Addressing common method variance and endogeneity in vocational behavior research: A review of the literature and suggestions for future research. *Journal of Vocational Behavior*, 121, 103472, 1-14.
- Cui, J. (2021a). The impact of entrepreneurship curriculum with teaching models on sustainable development of entrepreneurial mindset among higher education students in China: The moderating role of the entrepreneurial climate at the institution. *Sustainability*, 13, 7950, 1-16.
- Cui, J. (2021b). The influence of entrepreneurial education and psychological capital on entrepreneurial behavior among college students. *Frontiers in Psychology*, 12, 755479, 1-12.
- Cui, J., Sun, J., & Bell, R. (2021). The impact of entrepreneurship education on the entrepreneurial mindset of college students in China: The mediating role of

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- inspiration and the role of educational attributes. *The International Journal of Management Education*, 19(1), pp.1-16.
- Davis, M. H., Hall, J. A., & Mayer, P. S. (2016). Developing a new measure of entrepreneurial mindset reliability, validity, and implications for practitioners. *Consulting Psychology Journal: Practice and research*, 68(1), 21-48.
- Davidsson, P. (2005). *Researching Entrepreneurship*. New York: Springer.
- Doanh, D. C. (2021). The role of contextual factors on predicting entrepreneurial intention among Vietnamese students. *Entrepreneurial Business and Economics Review*, 9(1), 169-187.
- Dou, X. H., Zhu, X. J., Zhang, J. Q., & Wang, J. (2019). Outcomes of entrepreneurship education in China: A customer experience management perspective. *Journal of Business Research*, 103, 338-347.
- Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality and development*. Philadelphia, Penn: Taylor and Francis/Psychology Press.
- E. C. (2012). *Effects and Impact of Entrepreneurship Programmes in Higher Education*. Brussels, European Commission, DG Enterprise and Industry.
- Fayolle, A., & Gailly, B. (2006). Assessing the impact of entrepreneurship education programmes: A new methodology. *Entrepreneurship Education Programmes*, 30(9), 701-720.
- Fayolle, A., & B. Gailly. 2015. The Impact of Entrepreneurship Education on Entrepreneurial Attitudes and Intention: Hysteresis and Persistence. *Journal of Small Business Management*, 53 (1): 75–93.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Forret, M. L., & Dougherty, T. W. (2001). Correlates of networking behavior for managerial and professional employees. *Group & Organization Management*, 26(3), 283-311.
- Franke, N., & Lüthje, C. (2004). Entrepreneurial intentions of business students: A benchmarking study. *International Journal of Innovation and Technology Management*, 1(3), 269-288.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Gartner, W. B. (1988). 'Who is an entrepreneur?' is the wrong question. *Entrepreneurship Theory & Practice*, 20(2), 75-84.
- Gibb, A. (2002). In pursuit of a new "enterprise" and "entrepreneurship" paradigm for learning: Creative destruction, new values, new ways of doing things and new combinations of knowledge. *International Journal of Management Reviews*, 4(3), 233-269.
- Gielnik, M. M., Frese, M., Kahara-Kawuki, A., & Katono, I. W. et al. (2015). Action and action-regulation in entrepreneurship: Evaluating a student training for promoting entrepreneurship. *Academy of Management Learning & Education*, 14(1), 69-94.
- Gieure, C., Benavides-Espinosa, M. M., & Roig-Bobón, S. (2020). The entrepreneurial process: The link between intentions and behavior. *Journal of Business Research*, 112, 541-548.
- Guerrero, M., Urbano, D., Cunningham, J. A., & Gajon, E. (2018). Determinants of graduates' start-ups creation across a multi-campus entrepreneurial university: The case of Monterey institute of technology and higher education. *Journal of Small Business Management*, 56(1), 150-178.
- Gupta, A. K., & Govindarajan, V. (2002). Cultivating a global mindset. *Academy of Management Executive*, 16(1), 116-126.
- Haddoud, M. Y., Onjewu, A. E., Nowinski, W., & Alammari, K. (2020). Assessing the role of entrepreneurship education in regulating emotions and fostering implementation intention: Evidence from Nigerian universities. *Studies in Higher Education*, <https://doi.org/10.1080/03075079.2020.1758652>.
- Hahn, D., Minola, T., Gils, A. V., & Huybrechts, J. (2017). Entrepreneurial education and learning at universities: Exploring multilevel contingencies. *Entrepreneurial and Regional Development*, 29(9-10), 945-974.
- Harman, H.H. (1967). *Modern Factor Analysis*. Chicago, IL: University of Chicago Press.
- Haynie, M., & Shepherd, D. A. (2009). A measure of adaptive cognition for entrepreneurship research. *Entrepreneurship Theory and Practice*, 33(2), 695-714.
- Haynie, J. M., Shepherd, D., Mosakowski, E., & Earley, P. C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*, 25(2), 217-229.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Ho, M. H. R., Uy, M. A., Kang, B. N., & Chan, K. Y. (2018). Impact of entrepreneurship training on entrepreneurial efficacy and alertness among adolescent youth. *Frontiers in Education*, 3,13, doi: 10.3389/educ.2018.00013.
- Hoang, G., Le, T.T.T., Tran, A.K.T., & Du, T. (2021). Entrepreneurship education and entrepreneurial intentions of university students in Vietnam: The mediating roles of self-efficacy and learning orientation. *Education + Training*, 63(1), 115-133.
- Honig, B., & Samulsson, M. (2012). Planning and the entrepreneur: A longitudinal examination of nascent entrepreneurs in Sweden. *Journal of Small Business Management*, 50(3), 365-388.
- Huang, Q., Liu, X., & Li, J. (2020). Contextualization of Chinese entrepreneurship research: An overview and some future research directions. *Entrepreneurship & Regional Development*, 32(5-6), 353-369.
- Hueso, J. A., Jaen, I., & Liñán, F. (2020). From personal values to entrepreneurial intention: A systematic literature review. *International Journal of Entrepreneurial Behavior & Research*, 27(3), 205-230.
- Hultén, P., & Tumunbayarova, Z. (2020). Building students' entrepreneurial mindsets: Results from an intervention at a Russian university. *International Journal of Management Education*, doi: 10.1016/j.ijme.2020.100380.
- Ireland, R. D., Hitt, M. A., & Sirmon, D. G. (2003). A model of strategic entrepreneurship: The construct and its dimensions. *Journal of Management*, 29(6), 963-989.
- Joensuu-Salo, S., Viljamaa, A., & Varamäki, E. (2020). Do intentions ever die? The temporal stability of entrepreneurial intention and link to behavior. *Education and Training*, 62(3), 325-338.
- Kaffka, G., & Krueger, N. (2018). The entrepreneurial “mindset”: Entrepreneurial intentions from the entrepreneurial event to neuroentrepreneurship. In Javadian, G. et al. (Eds.). *Foundational Research in Entrepreneurship Studies*, 210-211.
- Karlidag-Dennis, E., Hazenberg, R., & Dinh, A.T. (2020). Is education for all? The experiences of ethnic minority students and teachers in North-western Vietnam engaging with social entrepreneurship. *International Journal of Educational Development*, 77, 102224, 1-9.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrepreneurship Theory and Practice*, 39(3), 655-674.
- Kautonen, T., van Gelderen, M., & Tornikoski, E. T. (2013). Predicting entrepreneurial behavior: A test of the theory of planned behavior. *Applied Economics*, 45(6): 697-707.
- Kirkley, W. W. (2016). Entrepreneurial behaviour: The role of values. *International Journal of Entrepreneurial Behavior and Research*, 22(3), 290-328.
- Kuratko, D. F., Fisher, G., & Audretsch, D. B. (2020). Unravelling the entrepreneurial mindset. *Small Business Economics*, doi:10.1007/s11187-020-00372-6.
- Kutner, M. H., Nachtsheim, C. J., & Neter, J. (2004). *Applied Linear Regression Models*. New York: McGraw-Hill Irwin.
- Lackeus, M. (2020). Comparing the impact of three different experiential approaches to entrepreneurship in education. *International Journal of Entrepreneurial Behavior & Research*, 26(5), 937-971.
- Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The sources of four commonly reported cut-off criteria what did they really say? *Organizational Research Methods*, 9(2), 202-220.
- Lee, L., Wong, P. K., Foo, M. D., & Leung, A. (2011). Entrepreneurial intentions: The influence of organizational and individual factors. *Journal of Business Venturing*, 26(1), 124-136.
- Lieberman, N., & Trope, Y. (2008). The psychology of transcending the here and now. *Science*, 322, 1201-1205.
- Liñán, F. (2008). Skill and value perceptions: How do they affect entrepreneurial intentions? *International Entrepreneurship and Management Journal*, 4(3), 257-272.
- Liñán, F., & Chen, Y. W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), 593-617.
- Liñán, F., & Fayolle, A. (2015). A systematic literature review on entrepreneurial intentions: Citation, thematic analyses, and research agenda. *International Entrepreneurship and Management Journal*, 11(4), 907-933.
- Loan, L. T., Doanh, D. C., Thang, H. N., Nga, T. V., Van, P. T., & Hoa, P. T. (2021). Entrepreneurial behaviour: The effects of the fear and anxiety of Covid-19 and

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- business opportunity recognition. *Entrepreneurial Business and Economics Review*, 9 (3), 7-22.
- Lortie, J. & Castogiovanni, G. (2015). The theory of planned behavior in entrepreneurship research: What we know and future directions. *International Entrepreneurship Management Journal*. 11, 935-957.
- Mäkimurto-Koivumaa, S., & Belt, P. (2016). About, for, in or through entrepreneurship in engineering education. *European Journal of Engineering Education*, 41(5), 512-529.
- Maresch, D., Harms, R., Kailer, N., & Wimmer-Wurm, B. (2016). The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. *Technological Forecasting & Social Change*, 104, 172-179.
- Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211-224.
- Mathisen, J. E., & Arnulf, J. K. (2013). Competing mindsets in entrepreneurship: The cost of doubt. *The International Journal of Management Education*, 11(3), 132-141.
- Maula, M., & Stam, W. (2020). Enhancing rigor in quantitative entrepreneurship research. *Entrepreneurship Theory and Practice*, 44(6) 1059–1090.
- Mei, W. H., & Symaco, L. (2022). University-wide entrepreneurship education in China's higher education institutions: Issues and challenges. *Studies in Higher Education*, 47(1), 177-193.
- Mentoor, E. R., & Friedrich, C. (2007). Is Entrepreneurial education at South African universities successful? An empirical example. *Industry and Higher Education*, 21(3), 221-232.
- Morris, M. H., Webb, J. W., Fu, J., & Singbal, S. (2013). A competency-based perspective on entrepreneurship education: Conceptual and empirical insights. *Journal of Small Business Management*, 51(3), 352-369.
- Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), 277-299.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Naumann, C. (2017). Entrepreneurial mindset: A synthetic literature review. *Entrepreneurial Business and Economics Review*, 5(3), 149-172.
- Nowiński, W., Haddoud, M. Y., Lančarič, D., & Egerová, D. et al. (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, 44(2), 361-379.
- Nowiński, W., Haddoud, M., Wach, K., & Schaefer, R. (2020). Perceived public support and entrepreneurship attitudes: A little reciprocity can go a long way! *Journal of Vocational Behavior*, 121, 103474, 1-16.
- Oosterbeek, H., van Praag, M., & Ijsselstein, A. (2010). The Impact of Entrepreneurship Education on Entrepreneurship Skills and Motivation. *European Economic Review*, 54(3), 442–54.
- Pittaway, L., & Cope, J. (2007). Entrepreneurship education: A systematic review of the evidence. *International Small Business Journal*, 25(5), 479-510.
- Ployhart, R. E., & Moliterno, T. P. (2011). Emergence of the human capital resource: A multilevel model. *Academy of Management Review*, 36(1), 127-150.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P. (2003), Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88(5), 879–903.
- Politis, D., Winborg, J., & Dahlstrand, A. L. (2011). Exploring the resource logic of student entrepreneurs. *International Small Business Journal*, 30(6), 659-683.
- Rae, D. H., Matlay, P. M., & Penaluna, A. (2014). Freedom or prescription: The case for curriculum guidance in enterprise and entrepreneurship education. *Industry and Higher Education*, 26(6), 387-398.
- Raider, H. J., & Burt, R. S. (1996). Boundaryless careers and social capital. Arthur, M. B., & Rousseau, D. M. (Eds.), *The Boundaryless Career*, New York: Oxford University Press, 187-200.
- Rauch, A., & Hulsink, W. (2015). Putting entrepreneurship education where the intention to act lies: An investigation into the impact of entrepreneurship education on entrepreneurial behaviour. *Academy of Management Learning & Education*, 14(2), 187-204.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Rocca, A. L., & Snehota, I. (2020). Mobilizing suppliers when starting up a new business venture. *Industrial Marketing Management*, doi: 10.1016/j.indmarman.2020.08.002.
- Salamouris, I. S. (2013). How overconfidence influences entrepreneurship. *Journal of Innovation and Entrepreneurship*, 2(8), 1-8.
- Shahab, Y., Chenggang, Y., Arbizu, A. D., & Haider, M. J. (2019). Entrepreneurial self-efficacy and intention: Do entrepreneurial creativity and education matter? *International Journal of Entrepreneurial Behavior & Research*, doi:10.1108/IJEER-12-2017-0522.
- Shepherd, A. D., Patzelt, H., & Haynie, J. M. (2010). Entrepreneurial spirals: Deviation-amplifying loops of an entrepreneurial mindset and organizational culture. *Entrepreneurship Theory and Practice*, 34(1), 59-82.
- Sherkat, A., & Chenari, A. (2020). Assessing the effectiveness of entrepreneurship education in the universities of Tehran province based on an entrepreneurial intention model. *Studies in Higher Education*, doi:10.1080/03075079.2020.1732906.
- Shirokova, G., Osiyevskyy, O., & Bogatyreva, K. (2016). Exploring the intention-behavior link in student entrepreneurship: Moderating effects of individual and environmental characteristics. *European Management Journal*, 34, 386-399.
- Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, 22(4), 566-591.
- Stamboulis, Y., & Barlas, A. (2014). Entrepreneurship education impact on student attitudes. *The International Journal of Management Education*, 12(3), 365-373.
- Sull, D. N., & Spinosa, C. (2007). Promise-based management: The essence of execution. *Harvard Business Review*, 85(4), 79-86.
- Sun, H., Lo, C. T., Liang, B., & Wong, Y. L. B. (2017). The impact of entrepreneurial education on entrepreneurial intention of engineering students in Hong Kong. *Management Decision*, 55(7), 1371-1393.
- Tierney, P., Farmer, S. M., & Graen, G. B. (1999). An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology*, 52(3), 591-620.
- Tomy, S., & Pardede, E. (2020). An entrepreneurial intention model focusing on higher education. *International Journal of Entrepreneurial Behavior & Research*, 26(7), 1423-1447.

- Cui, J. & Bell, R. (2022) Behavioural entrepreneurial mindset: How entrepreneurial education activity impacts entrepreneurial intention and behaviour, *The International Journal of Management Education*, 20(2), 100639. [doi: 10.1016/j.ijme.2022.100639](https://doi.org/10.1016/j.ijme.2022.100639)
- Van Geldren, M., Kautonen, T., Wincent, J., & Binari, M. (2018). Implementation intentions in the entrepreneurial process: Concept, empirical findings, and research agenda. *Small Business Economics*, 51(4), 923-941.
- Vuorio, A. M., Puumalainen, K., & Fellnhofer, K. (2018). Drivers of entrepreneurial intentions in sustainable entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 24 (2), 359-381.
- Wach, K., & Wojciechowski, L. (2016). Entrepreneurial intentions of students in Poland in the view of Ajzen's theory of planned behaviour. *Entrepreneurial Business and Economics Review*, 4(1), 83-94.
- Wegner, D., Thomas, E., Teixeira, E. K., & Maehler, A. E. (2020). University entrepreneurial push strategy and students' entrepreneurial intention. *International Journal of Entrepreneurial Behavior & Research*, 26(2), 307-325.
- Whiteside, S. P., & Lynam, D. R. (2001). The five-factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, 30(4), 669-689.
- Wiklund J., Yu, W., Tucker, R., & Marino, D. (2017). ADHD, impulsivity and entrepreneurship. *Journal of Business Venturing*, 32, 627-656.
- Winborg, J., & Landström, H. (2000). Financial bootstrapping in small businesses: Examining small business managers' resource acquisition behaviors. *Journal of Business Venturing*, 16(3), 235-254.
- Yang, X. M., Sun, S. L., & Zhao, X. Y. (2019). Search and execution: Examining the entrepreneurial cognitions behind the lean startup model. *Small Business Economics*, 52(3), 667-679.
- Zaring, O., Gifford, E., & Mckelvey, M. (2019). Strategic choices in the design of entrepreneurship education: An explorative study of Swedish higher education institutions. *Studies in Higher Education*, 46(2), 343-358.
- Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial Intentions. *Journal of Applied Psychology*, 90(6), 1265-1272.

Appendix. Measurement items

[1] *Entrepreneurial behaviour* (Rauch & Hulsink, 2015)

EB1 – Have you already established your own business? [no] [yes], if ‘no’ then:

EB2 – Are you, alone or with others, currently trying to start a new business, including any self-employment, online retailing or selling any goods or services to others? [no] [yes], if ‘no’ then:

EB3 – Even though you currently may not be starting a venture, whether or not you have engaged in any behaviour in entrepreneurship in the last year? Please indicate this by answering [yes] or [no] to the following items:

EB3-1 – Spent a lot of time thinking about starting a business

EB3-2 – Organized a start-up team

EB3-3 – Defined market opportunities

EB3-4 – Prepared a business plan

EB3-5 – Selected a business name

EB3-6 – Created a legal entity

EB3-7 – Registered with the tax authorities

EB3-8 – Saved money to invest in a business

EB3-9 – Invested your own money in a business

EB3-10 – Required and received financial support

EB3-11 – Searched for facilities and equipment

EB3-12 – Purchased or leased major items, like equipment, facilities, or property

EB3-13 – Purchased raw materials, inventory, or supply

EB3-14 – Developed models or procedures for a product/service

EB3-15 – Started marketing or promotional activities

EB3-16 – Devoted full-time to the business

EB3-17 – Applied for licenses or patents

EB3-18 – Hired employees

EB3-19 – Nothing at all above

[2] *Engagement with entrepreneurial education activity* (Arranz’s et al., 2017)

Which of the following have you been involved in? If ‘no’, please choose [0], or indicate the extent to the benefit from each activity that you involved in (Likert Scale 1 to 7. 1 = “Lowest”; 7 = “Highest”):

EEA1 – Entrepreneurship clubs

EEA2 – Entrepreneurship design competition

EEA3 – Successful entrepreneur's speech

EEA4 – Enterprise visit or internship

EEA5 – Face-to-face communication with an entrepreneur

EEA6 – Conferences or workshops related to entrepreneurship

EEA7 – Business simulators or games

EEA8 – Entrepreneurial incubation project

EEA9 – Entrepreneurial activity of resourcing or networking

EEA10 – Entrepreneurial spirit and values transmitted by the university or colleges

[3] ***Behavioural entrepreneurial mindset***

Likert Scale 1 to 7. 1 = “Total disagreement”; 7 = “Total agreement”

Thinking of yourself, indicate your level of agreement with each of the following statements:

Focus yet adapt (Haynie & Shepherd, 2009)

BEM1 – When performing a task, I frequently assess my progress against my objectives.

BEM2 – I can come up with several solutions and select the best one when solving a problem.

BEM3 – I ask myself if there was an easier way to do things after I finish a task.

BEM4 – I ask myself questions about how well I am doing while I am performing a novel task.

Creativity (Tierney et al. 1999)

BEM5 – I often come up with new ideas.

BEM6 – It's easy for me to solve problems creatively.

BEM7 – I feel that I am good at generating novel ideas.

BEM8 – In general, I have a tendency to first trying new approaches or methods in my work.

Execution (Davis et al., 2015)

BEM9 – I'm good at taking a strategy and translating it into tactical action steps.

BEM10 – I'm good at getting things off the drawing board and into operation.

BEM11 – I have a reputation for being able to take an idea and make it work.

BEM12 – I'm good at turning others' ideas into reality.

Networking (Forret & Dougherty, 2001)

BEM13 – I maintain contacts outside my inner circle.

BEM14 – I often participate in social activities in my spare time.

BEM15 – I try to meet people who may be important for me.

BEM16 – I'm sensitive to others' feelings. (*Be dropped due to the lower loading*)

Resource leveraging (Winborg & Landström, 2000)

BEM17 – I usually adjust my goals according to changes in resources.

BEM18 – When I encounter difficulties, I often turn to external resources.

BEM19 – I am good at doing my own things using resources that others control.

Mobilizing others (EC, 2012)

BEM20 – I can stimulate the members of a team.

BEM21 – I am good at convincing others with facts.

BEM22 – I can pass on my ideas to others accurately.

[4] ***Entrepreneurial intention*** (Liñán & Chen, 2009)

Likert Scale 1 to 7. 1 = “Total disagreement”; 7 = “Total agreement”

Thinking of yourself, to what extent do you agree with each of following statements:

EI1 – I'm ready to do anything to be an entrepreneur.

EI2 – My professional goal is to become an entrepreneur.

EI3 – I will make every effort to start and run my own firm.

EI4 – I am determined to create a firm in the future.

EI5 – I have very seriously thought of starting a firm.

EI6 – I have the firm intention to start a firm someday.