

Understanding Entrepreneurial Intention in Undergraduates: Entrepreneurial Education as a Moderator

Kalaivani Jayaraman^{1*}, Jayamalathi Jayabalan¹, Komathi Munusamy¹,
Mahendra Kumar Chelliah¹, Farida Bhanu Mohamed Yousoof¹, Chong Chean You¹

¹ Faculty of Accountancy and Management, Univesiti Tunku Abdul Rahman, Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000, Kajang, Selangor, Malaysia

*Corresponding Author: kalaivani@utar.edu.my

Received: 10 January 2026 | Accepted: 25 March 2026 | Published: 1 April 2026

DOI: <https://doi.org/10.55057/ijares.2026.8.2.47>

Abstract: *Entrepreneurs are pivotal in driving business growth, fostering innovation, and strengthening economies through risk-taking and strategic decision-making. Their contributions build a competitive and future-ready market, positioning entrepreneurship as a catalyst for both economic and societal advancement. Despite extensive government initiatives in Malaysia to encourage entrepreneurship, participation among university graduates remain relatively low. This study integrates the Theory of Planned Behaviour (TPB) and Human Capital Theory (HCT) to investigate the determinants of entrepreneurial intention (EI) among Malaysian students. It examines the direct effects of entrepreneurial attitude (EA), perceived behavioural control (PBC), subjective norms (SN), and entrepreneurial education (EE) on EI, while assessing the moderating role of EE. A cross-sectional survey was conducted with 220 students from public and private institutions using stratified random sampling. The variables were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results demonstrated that EA, PBC, SN, and EE significantly affected EI. However, EE only moderates the PBC-EI relationship, with no significant moderating effects observed for EA-EI and SN-EI. These results underscore the importance of designing business education programs that not only transmit knowledge but also cultivate entrepreneurial passion, thereby enhancing students' readiness to engage in entrepreneurial activities.*

Keywords: Entrepreneurial Intention, Entrepreneurial Attitude, Perceived Behavioural Control, Subjective Norms

1. Introduction

Entrepreneurship is a key driver of Malaysia's economic transformation, fostering innovation, job creation, and social mobility (Song, Tominathan & Khalid, 2021). The government, through agencies such as the Ministry of Entrepreneurship, Growth and Co-operatives (MEDC) and the Ministry of Higher Education (MOHE), has introduced initiatives, such as the Entrepreneurship Integrated Education (EIE) Action Plan (2021-2025), to embed entrepreneurial knowledge and skills into higher education curricula. This aims to cultivate entrepreneurial mindsets among graduates and encourage entrepreneurship as a viable career path.

Entrepreneurial intention (EI) is widely recognised as the strongest predictor of entrepreneurial behaviour (Mothibi et al., 2025; Krueger et al., 2000; Autio et al., 2001). The theory of Planned Behaviour (TPB) explains EI through three determinants: entrepreneurial attitude, subjective norms, and perceived behavioural control (Ajzen, 1991). Entrepreneurial education (EE) enhances creativity, opportunity recognition, and self-efficacy, aligning with Human Capital Theory (HCT), which emphasizes education's role in improving productivity (European Commission, 2016; Martin et al., 2013; Liang et al., 2023).

Despite strong policy support, graduate participation in entrepreneurship remains low, with approximately 2% of Malaysian graduates pursuing entrepreneurship annually (Othman et al., 2023). Research findings on EE's effectiveness in fostering EI are mixed (Bae et al., 2014; Nabi et al., 2017), and limited studies have examined how EE interacts with TPB's psychological determinants. Thus, this study integrates TPB and HCT to investigate whether EE moderates the relationship between entrepreneurial attitude, subjective norms, perceived behavioural control, and EI among Malaysian undergraduates. Specifically, it asks: (1) Do these determinants directly impact EI? And (2) Does EE moderate their relationship with EI?

2. Literature Review

2.1 Entrepreneurship Attitude

Entrepreneurship attitude refers to an individual's favorable or unfavorable evaluation of entrepreneurial behavior (Vamvaka *et al.*, 2020; Abdullahi *et al.*, 2021). A positive attitude influences one's likelihood to pursue entrepreneurship (Linan & Chen, 2009; Eduardo *et al.*, 2024; Mensah *et al.*, 2021). Anyone with a positive attitude shapes entrepreneurial intention (Nayak *et al.*, 2023). Some studies stated no differences in the intention between male and female students to become entrepreneurs (Margasa *et al.*, 2021). While many confirm the positive effect of personal attitude toward entrepreneurial intention (Maheshwari, 2021; Hossain *et al.*, 2023; Blanco-Mesa *et al.*, 2024), others found no effect (Bayona-Ore, 2023). Following the arguments, the subsequent hypothesis was developed and examined in the study:

H01: Entrepreneurial attitude has a significant relationship with entrepreneurial intention.

2.2 Perceived Behavioural Control

Perceived behavioural control (PCB) showcases individual's ease or difficulty in performing entrepreneurial actions, based on access to resources, opportunities, and skills (Ashari *et al.*, 2021; Mensah *et al.*, 2021). PCB reflects the confidence level of an individual pursuing entrepreneurship (Nayak *et al.*, 2023). Some research shows gender-based differences (Margaca *et al.*, 2021), while other studies do not (Bazkiaei *et al.*, 2021). PCB significantly influences entrepreneurial intention according to the theory of planned behaviour (Maheshwari, 2021; Bayona-Ore, 2023), though some study shows indirect effects (Mahmood *et al.*, 2020). Based on the above outline, the following hypothesis was developed:

H02: Perceived Behavioral Control (PCB) has a significant effect on entrepreneurial intention.

2.3 Subjective Norms

Subjective norms involve perceived social pressure to perform entrepreneurial behaviour (Ashari *et al.*, 2021; Mensah *et al.*, 2021). As for students, they may face peer and family pressure to become entrepreneurs (Eduardo *et al.*, 2024; Al-Mamary & Alraja, 2022). Margaca *et al.* (2021) found no effect, while other researchers confirmed a positive impact (Bazkiaei *et al.*, 2021; Maheshwari, 2021; Bayona-Ore, 2023). Women may be more influenced by social

opinions (Sadat & Lin, 2020; Miller, 1976; Venkatesh *et al.*, 2000). Findings remain mixed (Duong, 2021; Sun *et al.*, 2017; Ahmed *et al.*, 2020; Maresch *et al.*, 2016; Shah *et al.*, 2020). Based on the above argument, hypothesis 3 is developed:

H03: Subjective norms have a significant relationship towards entrepreneurial intention.

2.4 Entrepreneur Education

Entrepreneur education (EE) enhances one's ability to identify opportunities and build self-confidence (Lopez *et al.*, 2021), shaping students' attitude and intentions to become entrepreneurs (Mensah *et al.*, 2021; Kayed *et al.*, 2022; Liu *et al.*, 2022). EE may improve students' human capital abilities, motivating them to seize and create opportunities (Grichnik *et al.*, 2014). Studies show students with EE are more likely to become entrepreneurs (Bui *et al.*, 2020; Mahmood *et al.*, 2020; Elert, Andersson & Wennberg, 2015; Olugbola, 2017). Based on the argument above, hypothesis 4 is developed:

H04: Entrepreneur education has a significant effect on entrepreneurial intention.

2.5 Moderating effects of EE on the relationship between entrepreneur attitude (AT), perceived control behaviour (PCB), subjective norms (SN), and entrepreneur intention (EI).

The purpose of this essay is to look at how entrepreneur education influences the relationship between AT, PCB, SN, and EI. EE builds competencies, enhances PCB, and strengthens the influence of social norms (Dohse & Walter, 2012; Morris *et al.*, 2013; Zhuang & San, 2023). Family support and EE improve entrepreneurship attitudes (Fayolle & Gailly, 2015; Karimi *et al.*, 2016; Bhat & Singh, 2018). Henceforth, we propose our following hypothesis:

H5a: Entrepreneurial education moderates the relationship between AT and EI.

H5b: Entrepreneurial education moderates the relationship between PCB and EI.

H5c: Entrepreneurial education moderates the relationship between SN and EI.

2.6 Theoretical Foundation and Framework Development

The Theory of Planned Behaviour (TPB) describes how individual attitudes and behaviours influence one another (Ajzen, 2020; Nayak *et al.*, 2023). TPB widely used in entrepreneurship studies (Alshebami *et al.*, 2020; Bhat & Singh, 2018; Kumar & Das, 2019). However, entrepreneurial education received less attention as a significant component in determining entrepreneurial inclination. The Human Capital Theory (HCT) complement TPB by emphasizing education and experience as key to entrepreneurial success (Douglas & Shepherd, 2002; Zhao *et al.*, 2005; Bae *et al.*, 2014). HCT support skills development and opportunity recognition (Marvel, 2013; Bruns *et al.*, 2008; Dimov, 2010). Based on the theory above, a conceptual framework (Fig. 1) for this study is developed:

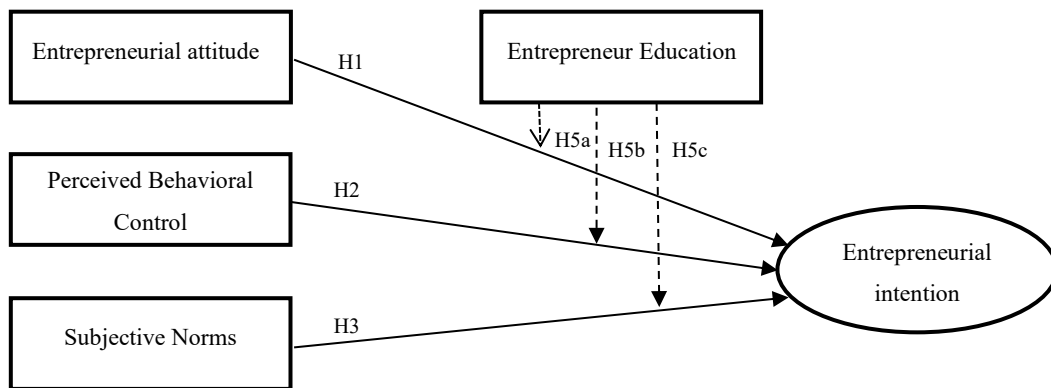


Figure 1: Conceptual Framework

3. Methodology

The current study uses a cross-sectional survey approach to evaluate the factors influencing entrepreneurial inclinations among Malaysian students. A quantitative approach design was employed using the self-administered questionnaire as the main instrument of data collection. The entrepreneurship-related education and policy frameworks developed contribute empirically to understanding determinants of entrepreneurial intention among Malaysian undergraduates.

3.1 Data

The sampling frame consists of Malaysian undergraduates from both public and private universities. Using G* Power, a minimum of 129 respondents was required, but 270 questionnaires will be distributed to enhance robustness. Stratified random sampling by gender ensures representativeness and accuracy in subgroup analysis (Liu & Pontius, 2021). Data collection will be conducted through structured, self-administered questionnaires, disseminated online and in person, with voluntary and anonymous participation.

The questionnaire is divided into three sections: Section A covers demographics such as age, gender, study field, entrepreneurship exposure, and university type. Section B measures independent variables: entrepreneurial attitude, perceived behavioural control, subjective norms, and entrepreneurial education, adapted from validated sources (Mensah et al., 2021; Bazkiaei et al., 2021; Astiana et al., 2022). Section C assesses entrepreneurial intention using items from Bazkiaei et al. (2021), Fathima Nasree et al. (2024), and Hassan et al. (2021). All constructs employ a 5-point Likert scale. Content validity was confirmed by expert review, and a pilot study with 30 respondents established reliability, with Cronbach's alpha values above 0.7.

Data analysis was conducted using SPSS for cleaning, exploration, and descriptive statistics, followed by Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS. Measurement validity was assessed through factor loadings, composite reliability, and convergent/discriminant validity, while structural evaluation included path coefficients, R² values, effect sizes, and predictive relevance. These analyses provide insights into the relationships between entrepreneurial attitude, perceived behavioural control, subjective norms, entrepreneurial education, and entrepreneurial intention, contributing to both theoretical understanding and practical policy development in Malaysia.

4. Results and Discussion

4.1 Descriptive Statistics

Out of the 270 questionnaires distributed both online and in person, 299 were returned, yielding a response rate of approximately 84 percent. After excluding nine questionnaires due to inconsistencies, the final sample size stood at 220. This falls within the recommended range of 200 to 400 participants for the most studies (Roscoe, 1975) and meets the requirements for PLS analysis. The respondents were undergraduate students, with male and female participants represented in nearly equal proportions. By university type, 56.4 percent of respondents were enrolled in private institutions, while 43.6 percent attended public universities. In terms of academic programmes, the largest group came from business and economics (30%), followed by education (28%), arts and humanities (15%), law (10.9%), medicine and health sciences (10.5%), and engineering (8.6%), with other programmes accounting for between 0.5% and 1%. Regarding entrepreneurial intention, 63.2 percent of respondents expressed interest in starting a business, whereas 36.8 percent reported no such interest.

4.2 Common Method Bias

Common method bias (CMB) was identified using Partial Least Squares (PLS). The Variance Inflation Factor (VIF) threshold should be 3.3 or 5.0 (Kock & Lynn, 2012). If all VIFs are at or below the threshold (3.3 or 5), the model is considered free from CMB. In this case, all the VIFs are below 3.3; therefore, CMB is unlikely to affect this study's findings.

4.3 Exploratory Factor Analysis

Table 1 indicates the factor loading (FL) for each item. Items with high loadings (>.5) for the same factors were selected so that each factor was represented by a distinct cluster of variables. All item loadings are more than 0.5, indicating high item dependability. Cronbach's alpha values for all components are more than 0.7, suggesting the scale's strong internal consistency. As a result, no items were removed, and the criteria was satisfied and verified in this investigation.

The composite reliability (CR) for all excellent constructs is more than 0.7, showing internal consistency (Hair *et al.* 2010). All constructs have an average variance extracted (AVE) greater than the acceptable threshold of 0.5 (Fornell & Larcker, 1981), indicating the constructs' convergent validity. The following result demonstrates discriminant validity, which reflects all constructs by assessing each question for higher cross-loadings (CL) (Chin, 1998).

Table 1: PLS algorithm analysis

Variable	Indicator	FL	CA	CR (rho_c)	AVE	CL
Entrepreneurial Attitude	EA2	0.927	0.837	0.837	0.860	0.927
	EA4	0.927				0.927
Entrepreneurial Education	EE1	0.849	0.868	0.869	0.716	0.849
	EE2	0.834				0.834
	EE4	0.857				0.857
	EE5	0.845				0.845
Entrepreneurial Intention	EI1	0.906	0.959	0.960	0.858	0.906
	EI2	0.906				0.906
	EI3	0.93				0.93
	EI4	0.944				0.944
	EI5	0.944				0.944

Perceived Behavioural Control	PBC2	1	1	1	1	1
Subjective Norms	SN1	0.865	0.801	0.863	0.553	0.865
	SN2	0.862				0.862
	SN3	0.78				0.78
	SN4	0.579				0.579
	SN5	0.577				0.577

Discriminant validity explains the differences between each construct and other constructs (Hair *et al.*, 2010). It is possible to do this by reducing correlations between all variables and other construct measurements. To acquire a better understanding of discriminant validity, the AVE square root is compared to other notions. If the connection is larger than other constructs, discriminant validity is established (Fornell & Larcker, 1981). According to Hensler *et al.* (2015), the cut-off value for determining discriminant validity between two conceptions is 0.85 to 0.90. The results in Table 2 show that all the HTMT ratios are less than 0.90, indicating that there is no discriminant validity problem in this study. Based on prior HTMT results, it is determined that discriminant validity is demonstrated in this investigation.

Table 2: HTMT Results

	EA	EE	EI	PBC	SN
EA					
EE	0.898				
EI	0.824	0.763			
PBC	0.637	0.559	0.774		
SN	0.616	0.708	0.712	0.638	

4.4 Structural Model

The structural model clarified the relationship between the constructs hypothesised in this study framework. Figure 2 and Table 3 show the results of the structural model based on PLS output. Entrepreneur Attitude (EA), Perceived Behavioural Control (PBC), Subjective Norms (SN), and Entrepreneur Education (EE), found to be significantly related to Entrepreneurial Intention (EI). Entrepreneur Attitude (EA) was found to be positively influenced by EI ($P=0$, $P<0.05$). Then, H1 is supported. PBC positively influences EI ($P=0$, $P<0.05$). Then, H2 is supported. SN positively influences EI ($P=0$, $P<0.05$). Therefore, H3 is supported. Similarly, EE is positively influenced by EI ($p=0.025$, $p<0.05$). Hence, H4 is supported.

Regarding the moderating effects of EE on the relationship between EA, PBC, SN, and EI (H5a, H5b, and H5c). EE has non-significant relationships between EA and EI. Hence, H5a is not supported ($p=0.286$, $p>0.05$). However, EE has a moderating relationship between PBC and EI ($P = 0.023$, $P<0.05$). Then, H5b is supported. Finally, EE has a non-significant but positive moderating effect on the relationship between SN and EI ($p = 0.141$, $p>0.05$). Then H5c is not supported.

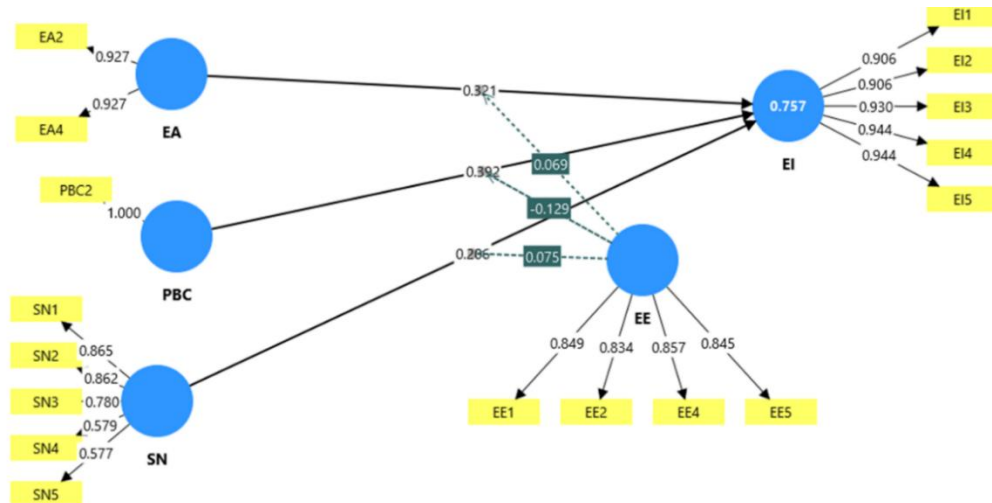


Figure 2: The Structural Model

Table 3: Direct and Indirect Effects

Direct Effects	T statistics	P values	Results
EA -> EI	5.066	0	Supported
EE -> EI	2.243	0.025	Supported
PBC -> EI	6.801	0	Supported
SN -> EI	3.724	0	Supported
Indirect Effects (Moderation)			
EE x EA -> EI	1.066	0.286	Not supported
EE x PBC -> EI	2.28	0.023	Supported
EE x SN -> EI	1.472	0.141	Not supported

Overall, of the study was able to answer the research questions 1 and 2. Here are the conclusions from the analysis. Based on the research question 1, PBC, EA, SN and EE have a direct effect on EI. This is further supported by the hypothesis 1, 2, 3 and 4. While answering to research question 2, only EE is found to moderate between PBC and EI. As a conclusion a table is drawn to link the research questions and hypothesis below:

RQ	Hypothesis	Results
RQ1: Does PBC, Entrepreneur Attitude, Entrepreneur Education, and Subjective Norms have a direct impact on EI?	H01: Entrepreneurial attitude has a significant effect on entrepreneurial intention.	(P=0, P<0.05) Supported
	H02: PBC has a significant effect on entrepreneurial intention.	(P=0, P<0.05) Supported
	H03: Subjective norms have a significant effect on entrepreneurial intention.	(P=0, P<0.05) Supported
	H04: Entrepreneur education has a significant effect on entrepreneurial intention.	(p=0.025, p<0.05) Supported
RQ2: Can EE play a moderating role between PBC, Entrepreneur Attitude, Subjective Norms, and EI?	H5a: Entrepreneurial education moderates the relationship between AT and EI.	(p=0.286, p>0.05) NOT Supported
	H5b: Entrepreneurial education moderates the relationship between PBC and EI.	(P = 0.023, P<0.05) Supported
	H5c: Entrepreneurial education moderates the relationship between SN and EI.	(p = 0.141, p>0.05) NOT Supported

4.5 Discussion

The effect of entrepreneurial attitude (AT) perceived behavioral control (PBC), subjective norms (SN), and entrepreneurial education (EE) on entrepreneurial intention (EI) was tested in this research. All four hypotheses (H01, H02, H03, H04) are supported by the results, verifying that all these variables have an important role to play in the intention of individuals to undertake entrepreneurial activities. The positive and statistically significant relationship between AT and EI justifies Ajzen (1991) Theory of Planned Behavior (TPB), which suggests that a favorable individual attitude towards a behavior will render one more likely to adopt it. Entrepreneurs who view entrepreneurship as personally rewarding and goal-concordant are likely to develop entrepreneurial intentions. This result is consistent with previous empirical work (Liñán & Chen, 2009; Kautonen *et al.*, 2015), which supports that entrepreneurial intention-making is driven by key motivational drivers of perceived value and desirability of entrepreneurship.

The powerful influence of PBC on EI supports the TPB's contention that people believe in their ability to perform entrepreneurial tasks—traditionally assigned to self-efficacy and perceived competence—directly influences their intention to act. This finding is consistent with previous research (Zhao *et al.*, 2005; Schlaegel & Koenig, 2014), suggesting that those with high perceived control over behavior will be more likely to pursue entrepreneurial endeavors, since they feel they have the resources and capabilities to achieve success. The positive relationship between SN and EI underscores the importance of social environment and normative pressure in shaping entrepreneurial intention. Positive feedback from family, peers, and mentors increases people's confidence and motivation to become entrepreneurs. This is in line with Krueger *et al.* (2000) and Autio *et al.* (2001), who argue that cultural and social expectations can significantly influence entrepreneurial intention, particularly in collectivist societies where interpersonal approval is a salient factor.

The dominating role of EE on EI reiterates the transformative quality of formal entrepreneurial education in fostering entrepreneurial orientations. By instilling core knowledge, functional know-how, and arousing awareness, EE directly contributes to fostering entrepreneurial intention. This finding resonates with the propositions put forward by Fayolle and Gailly (2015) and Nabi *et al.* (2017), and meta-analytic results (Bae *et al.*, 2014), all of which concur that formal training in entrepreneurial skills has a positive impact on the tendency of students to pursue entrepreneurial behavior.

This study commenced by proposing entrepreneurial education (EE) to function as a moderator on the relationships between entrepreneurial attitude (AT), perceived behavioral control (PBC), subjective norms (SN), and entrepreneurial intention (EI). It was assumed that EE would strengthen or weaken the impacts of these antecedents on EI. Confirmation of the postulated moderating hypotheses (H5a and H5c) did not emerge in this study, which suggests EE, as employed in this research, stimulates nor reduces the effects on EI present between the psychological determinants under study. This lack of significant moderation is problematic for the consideration of the role and influence of EE in the formation of entrepreneurial intentions. In contrast to certain previous works that have posited a moderating or even catalyzing role for EE by enhancing entrepreneurial attitudes, perceived self-efficacy, or social norm sensitivity (Fayolle & Gailly, 2015; Nabi *et al.*, 2017), our findings show a more nuanced picture. Instead of having a direct impact on how AT, PBC, and SN influence EI, EE could do so indirectly.

This study started by proposing that Entrepreneurial Education (EE) serves as a moderator between important psychological antecedents Entrepreneurial Attitude (AT), Perceived Behavioral Control (PBC), Subjective Norms (SN) and Entrepreneurial Intention (EI). For

example, Hypothesis H5a proposed a moderation effect of EE on AT–EI, while Hypothesis H5c proposed a moderation for SN–EI.

The findings only provided support for the moderating role of EE in the Perceived Behavioral Control (PBC)-Entrepreneurial Intention (EI) relationship, as posited in H5b. However, neither H5a nor H5c was confirmed, indicating that EE, as operationalized in this research, did not significantly augment or suppress the impacts of AT and SN on EI. This absence of significant moderation is interesting and raises questions regarding EE's assumed catalytic role in shaping entrepreneurial intention along attitudinal or normative processes. While Fayolle and Gailly (2015) and Nabi *et al.* (2017) pointed out that entrepreneurship education can enhance entrepreneurs' entrepreneurial attitude and social norm sensitivity, this study provides evidence for a more context-specific and implicit role of EE. A further hypothesis is that EE could act primarily to cultivate entrepreneurial abilities and self-efficacy, which influence more directly the PBC–EI chain than attitudinal or normative beliefs (Martin *et al.*, 2013). This interpretation concurs with the thesis that EE enhances individuals' control beliefs and entrepreneurial competence required for entrepreneurship more than modifying strongly rooted attitudes or perceptions of social acceptance.

In addition, Nowiński *et al.* (2019) warn that the effects of EE may differ greatly based on program structure, teaching methods, and institutional or cultural environments. Thus, the null findings for H5a and H5c can be attributed to the mode or nature of EE employed in the present study context, which possibly was not experiential, interactive, or value-based enough to influence attitudinal and normative measures. This positive finding points to the complexity of EE's role. While it cannot work as a worldwide moderator in every psychological predictor of EI, it nevertheless can work through indirect channels—e.g., by increasing exposure, confidence, and acquaintance with entrepreneurship—which could, in its turn, indirectly influence AT and SN through longitudinal mechanisms (Walter & Block, 2016).

The findings suggest that education for entrepreneurship, while important, may not necessarily mediate all entrepreneurial intention predictors equally. Upcoming studies need to explore other conceptualizations of EE, for instance, its intensity, quality, and interactivity, and investigate mediating or sequential processes through which it may impact entrepreneurial attitudes and social influences over time. This study started by proposing a moderating hypothesis H5b, in which entrepreneurial education (EE) serves as a moderator between perceived behavioral control (PBC) and entrepreneurial intention (EI). This is because EE contributes to enhancing individuals' entrepreneurial self-efficacy, entrepreneurial competence, and perceived control of entrepreneurial behavior.

According to Ajzen's (1991) Theory of Planned Behavior (TPB), PBC is a significant determinant of the intention of an individual to engage in behaviour when they believe that they possess the resources and ability needed. EE facilitates perception by providing individuals with the requisite information, skills, and self-confidence and therefore increases their PBC. Empirical evidence supports the moderating role of EE. For instance, Fayolle, Gailly, and Lassas-Clerc (2006) identified that entrepreneurial education not only impacts the level of entrepreneurial intention but also the intensity of the connection between TPB constructs and intention. Similarly, Zhang *et al.* (2014) developed that EE mediates PBC's effect on EI by reinforcing a better belief in entrepreneurial feasibility. That is, individuals who are exposed to entrepreneurial education perceive themselves as having more capability to start a business, and this supports the role of PBC in shaping entrepreneurial intention. The addition of EE as a moderator is therefore both theoretically grounded and

empirically warranted and illustrates its central contribution to the development and strengthening of the cognitive processes in entrepreneurial intention.

One way this could happen is that EE influences EI indirectly, perhaps by enhancing competencies such as opportunity recognition, critical thinking, or entrepreneurial self-efficacy competencies not directly measured as moderators in our current model (Bae *et al.*, 2014; Nabi *et al.*, 2017). Furthermore, the operationalization of EE in this study could have inhibited its potential as a moderator. For instance, if EE were defined as formal coursework and not experiential or hands-on, its transformative impact on students' psychological drivers could be diluted (Martin *et al.*, 2013). Another consideration is contextual variation in the functioning of EE across various cultural or institutional settings. As Liñán and Fayolle (2015) emphasize, effectiveness and mechanisms of EE may differ widely depending on the surrounding entrepreneurial environment, educational infrastructure, and societal attitudes towards entrepreneurship. Therefore, this study's insignificant results may be a sign of contextual boundaries instead of pan-universal ineffectiveness of EE as a moderator.

In general, what these results identify is the need for the implementation and design of EE programs to be considered more critical. Perhaps it would be more helpful to explore EE as a mediating variable or even as a direct predictor of EI and entrepreneurial competence, rather than merely as a moderator of existing psychological relations. Follow-up studies must consider more sophisticated and multi-dimensional models of EE, such as pedagogical style variation, duration, intensity, and cultural applicability, to gain a deeper understanding of its impact on entrepreneurial intention formation.

5. Conclusion and Future Directions

Theoretical and Practical Implications

This research enhances the verification of the Theory of Planned Behavior (Ajzen, 1991) by proving that AT, PBC, and SN are essential cognitive predictors of entrepreneurial intention. It also adds to the wider literature in terms of determining EE as a single, independent predictor of EI, thereby extending the TPB model and providing a more inclusive model for explaining entrepreneurial decision-making. The outcomes support the execution of entrepreneur-oriented curricula to change attitudes, to improve perceived competences, and to create a supportive social context. Educative authorities and governments can foster entrepreneurial networks that provide not only financial and infrastructural support but also social support, peer mentoring, and visibility to reinforce social support networks. Experiential and action-based learning methods should be incorporated into training courses, such as business simulations, startup incubators, and real project-based assignments, to enhance learners perceived behavioral control and entrepreneurial self-efficacy.

Limitations and Directions for Future Research

While the study offers valuable insights, several limitations need to be mentioned. The cross-sectional design limits the ability to establish causality. Longitudinal studies are recommended to better reflect the temporal processes of entrepreneurial intention formation. As the findings are context-specific, specifically focusing on regional or national cultural characteristics, future studies must replicate the evaluation across different settings to verify the universality of the identified relationships. Future research should investigate other psychological and situational variables like fear of failure, entrepreneurial experience, resilience, or risk-taking that may potentially mediate or moderate the relationship between EE and EI. Future studies could explore alternative moderators (e.g., prior entrepreneurial experience, family background) or

assess different dimensions of EE (e.g., experiential vs. theoretical training). Longitudinal designs could also help determine whether EE's effects evolve over time.

Acknowledgement

I would like to express my sincere gratitude to all my team members for their contribution, both directly and indirectly, to the completion of this study.

Conflict of Interest Statement

There is no conflict of interest regarding the publication of this study.

References

- Abdullahi, M. S., Khalid, N., Ahmed, U., Ahmed, E. M., & Gumawa, A. M. (2021). Effect of Entrepreneurship Education on Entrepreneurial Intention among University Students. *Journal of Technical Education and Training, 13*(3).
- Ahmed, T., Chandran, V. G. R., Klobas, J. E., Liñán, F., & Kokkalis, P. (2020). Entrepreneurship education programmes: How learning, inspiration and resources affect intentions for new venture creation in a developing economy. *The International Journal of Management Education, 18*(1), 100327.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.
- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human behavior and emerging technologies, 2*(4), 314-324.
- Al-Mamary, Y. H. S., & Alraja, M. M. (2022). Understanding entrepreneurship intention and behavior in the light of TPB model from the digital entrepreneurship perspective. *International Journal of Information Management Data Insights, 2*(2), 100106.
- Alshebami, A., Al-Jubari, I., Alyoussef, I., & Raza, M. (2020). Entrepreneurial education as a predictor of community college of Abqaiq students' entrepreneurial intention. *Management Science Letters, 10*(15), 3605-3612.
- Ashari, H., Abbas, I., Abdul-Talib, A.-N., & Mohd Zamani, S. N. (2021). Entrepreneurship and Sustainable Development Goals: A Multigroup Analysis of the Moderating Effects of Entrepreneurship Education on Entrepreneurial Intention. *Sustainability, 14*(1), 431.
- Astiana, M., Malinda, M., Nurbasari, A., & Margaretha, M. (2022). Entrepreneurship Education Increases Entrepreneurial Intention Among Undergraduate Students. *European Journal of Educational Research, 11*(2), 995–1008.
- Autio, E., Keeley, R. H., Klofsten, M., Parker, G. G. C., & Hay, M. (2001). Entrepreneurial intent among students in Scandinavia and in the USA. *Enterprise and Innovation Management Studies, 2*(2), 145-160.
- 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 and Practice, 38*(2), 217-254.
- Bayona-Oré, S. (2023). The Theory of Planned Behaviour and the Entrepreneurial Intention of University Students. *Journal of Turkish Science Education.*
- Bazkiaei, H. A., Khan, N. U., Irshad, A.-R., & Ahmed, A. (2021). Pathways toward entrepreneurial intention among Malaysian universities' students. *Business Process Management Journal, ahead-of-print*(ahead-of-print).
- Bhat, I. H., & Singh, S. (2018). Analyzing the moderating effect of entrepreneurship education on the antecedents of entrepreneurial intention. *Journal of Entrepreneurship Education, 21*(1), 1-10.

- Blanco-Mesa, F., Niño-Amézquita, D., & Gutiérrez-Ayala, J. (2024). Entrepreneurial intention among Colombian university students: A theory of planned behavior analysis in Colombia. *Cuadernos de Gestión*, 24(2), 83-94.
- Bruns, V., Holland, D.V., Shepherd, D.A., & Wiklund, J. (2008). The role of human capital in loan officers' decision policies. *Entrepreneurship Theory and Practice*, 32(3), 485–506.
- Bui, T. H. V., Nguyen, T. L. T., Tran, M. D., & Nguyen, T. A. T. (2020). Determinants Influencing Entrepreneurial Intention among Undergraduates in Universities of Vietnam. *The Journal of Asian Finance, Economics, and Business*, 7(7), 369-378.
- Chin, W. W. (1998). Commentary: Issues and Opinion on Structural Equation Modeling. *Management Information Systems Quarterly*, 22(1), vii-xvi.
- Dimov, D. (2010). Nascent entrepreneurs and venture emergence: Opportunity confidence, human capital, and early planning. *Journal of Management Studies*, 47(6), 1123–1153.
- Dohse, D., & Walter, S.G. (2012). Knowledge context and entrepreneurial intentions among students. *Small Business Economic*, 39, 877-895.
- Douglas, E. J., & Shepherd, D. A. (2002). Self-employment as a career choice: Attitudes, entrepreneurial intentions, and utility maximization. *Entrepreneurship theory and practice*, 26(3), 81-90.
- Duong, C. D. (2021). Exploring the link between entrepreneurship education and entrepreneurial intentions: The moderating role of educational fields. *Education + Training*.
- Eduardo, L., Lucía Muñoz-Pascual, & Jesús Galende. (2024). Innovation and sustainability from the perspective of entrepreneurial intention: a cross-cultural approach. *Education + Training*.
- Elert, N., Andersson, F. W., & Wennberg, K. (2015). The impact of entrepreneurship education in high school on long-term entrepreneurial performance. *Journal of Economic Behavior & Organization*, 111, 209-223.
- European Commission. (2016). *Entrepreneurship education at school in Europe*. Eurydice Report. Publications Office of the European Union.
- Fayolle, A. & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of Small Business Management*, 53(1), 75-93.
- Fayolle, A., Gailly, B., & Lassas-Clerc, N. (2006). Effect and counter-effect of entrepreneurship education and social context on student's intentions. *STEM Entrepreneurship Journal*, 2(1), 1-22.
- Fornell, C., & Larcker, D.F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50.
- Grichnik, D., Brinckmann, J., Singh, L., & Manigart, S. (2014). Beyond environmental scarcity: Human and social capital as driving forces of bootstrapping activities. *Journal of Business Venturing*, 29(2), 310-326.
- Hair, J. F. Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th ed.). Pearson Prentice Hall, New Jersey
- Hassan, A., Anwar, I., Saleem, I., Islam, K. B., & Hussain, S. A. (2021). Individual entrepreneurial orientation, entrepreneurship education and entrepreneurial intention: The mediating role of entrepreneurial motivations. *Industry and Higher Education*, 35(4), 403-418.
- Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling. *J. of the Acad. Mark. Sci*, 43, 115–135.

- Hossain, M. I., Tabash, M. I., Siow, M. L., Ong, T. S., & Anagreh, S. (2023). Entrepreneurial intentions of Gen Z university students and entrepreneurial constraints in Bangladesh. *Journal of Innovation and Entrepreneurship*, 12(1).
- Karimi, S., Biemans, H.J., Lans, T., Chizari, M. & Mulder, M. (2016). The impact of entrepreneurship education: A study of Iranian students' entrepreneurial intentions and opportunity identification. *Journal of Small Business Management*, 54(1), 187-209.
- Kayed, H., Al-Madadha, A., & Abualbasal, A. (2022). The Effect of Entrepreneurial Education and Culture on Entrepreneurial Intention. *Organizacija*, 55(1), 18–34.
- 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.
- Kock, N., & Lynn, G.S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), 546-580.
- Kumar, S., & Das, S. (2019). An extended model of theory of planned behaviour: Entrepreneurial intention, regional institutional infrastructure and perceived gender discrimination in India. *Journal of Entrepreneurship in Emerging Economies*, 11(3), 369-391.
- Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5-6), 411-432.
- Liang, X., Liu, Y., & Zhang, Y. (2023). Digital literacy and entrepreneurial ventures: The moderating role of entrepreneurship education. *Technological Forecasting and Social Change*, 186, 122-135.
- Linan, 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
- Linan, 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.
- Liu, Y., Li, M., Li, X., & Zeng, J. (2022). Entrepreneurship education on entrepreneurial intention: The moderating role of the personality and family economic status. *Frontiers in Psychology*, 13.
- Liu, Z., & Pontius, R. G., Jr. (2021). The Total Operating Characteristic from Stratified Random Sampling with an Application to Flood Mapping. *Remote Sensing*, 13(19), 3922.
- Lopez, T., Alvarez, C., Martins, I., Perez, J. P., & Román-Calderón, J. P. (2021). Students' perception of learning from entrepreneurship education programs and entrepreneurial intention in Latin America. *Academia Revista Latinoamericana de Administración*, 34(3), 419–444.
- Maheshwari, G. (2021). Factors influencing entrepreneurial intentions the most for university students in Vietnam: educational support, personality traits or TPB components? *Education + Training, ahead-of-print*(ahead-of-print).
- Mahmood, R., Zahari, A. S. M., Ibrahim, N., Nik Jaafar, N. F. H. & Yaacob, N. M. (2020). The Impact of Entrepreneur Education on Business Performance. *Asian Journal of University Education*, 16(4), 171-180.
- 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 and Social Change*, 104, 172-179.

- Margaça, C., Hernández-Sánchez, B., Sánchez-García, J. C., & Cardella, G. M. (2021). The Roles of Psychological Capital and Gender in University Students' Entrepreneurial Intentions. *Frontiers in Psychology, 11*.
- 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.
- Marvel, M. R. (2013). Human capital and search-based discovery: A study of high-tech entrepreneurship. *Entrepreneurship theory and practice, 37*(2), 403-419.
- Mensah, I. K., Zeng, G., Luo, C., Xiao, Z., & Lu, M. (2021). Exploring the Predictors of Chinese College Students' Entrepreneurial Intention. *SAGE Open, 11*(3)
- Miller, J. B. (1976). *Toward a new psychology of women*. Boston: BeaconPress.
- Ministry of Higher Education Malaysia. (2023). *Graduate employability and entrepreneurship report 2023*. MOHE.
- Morris, M. H., Webb, J. W., Fu, J., & Singhal, S. (2013). A competency-based perspective on entrepreneurship education: conceptual and empirical insights. *Journal of small business management, 51*(3), 352-369.
- Mothibi, N. H., Malebana, M. J., & Rankhumise, E. M. (2025). Determinants of entrepreneurial behaviour among vocational college and university students in Gauteng, South Africa: A theory of planned behaviour perspective. *Sustainability, 17*(9), 4175.
- Nabi, G., Linan, 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.
- Nasreen, F., Ramzy, M. I., Fern, Y. S., & Ai, Y. J. (2024). Predicting factors that inspire entrepreneurial intention among Malaysian university students. *MOJEM: Malaysian Online Journal of Educational Management, 12*(1), 55-81.
- Nayak, P. M., Joshi, H. G., Nayak, M., & Gil, M. T. (2023). The moderating effect of entrepreneurial motivation on the relationship between entrepreneurial intention and behaviour: An extension of the theory of planned behaviour on emerging economy. *F1000Research, 12*, 1585.
- Nowinski, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C. (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. <https://doi.org/10.1080/03075079.2017.1365359>
- Olugbola, S. A. (2017). Exploring entrepreneurial readiness of youth and startup success components: Entrepreneurship training as a moderator. *Journal of Innovation & Knowledge, 2*(3), 155-171.
- Othman, N. H., Musa, R., & Salleh, M. F. M. (2023). The impact of entrepreneurial education on entrepreneurial intention among university students in Malaysia. *Journal of Entrepreneurship in Emerging Economies, 15*(2), 345-362.
- Roscoe, J.T. (1975) *Fundamental Research Statistics for the Behavioural Sciences* (2nd Ed.). New York: Holt Rinehart & Winston.
- Sadat, A. M., & Lin, M. L. (2020). Examining the student entrepreneurship intention using TPB approach with gender as moderation variable. *International Journal of Innovation, Creativity and Change, 13*(6), 193-207.
- Schlaegel, C., & Koenig, M. (2014). Determinants of entrepreneurial intent: A meta-analytic test and integration of competing models. *Entrepreneurship Theory and Practice, 38*(2), 291-332.
- Shah, I. A., Amjed, S., & Jaboob, S. (2020). The moderating role of entrepreneurship education in shaping entrepreneurial intentions. *Journal of Economic Structures, 9*(1).

- Song, S. I., Thominathan, S., & Khalid, N. A. (2021). Entrepreneurial intention of UiTM students and the mediating role of entrepreneurship education. *Asian Journal of University Education (AJUE)*, 7(2), 236-251.
- 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.
- Vamvaka, V., Stoforos, C., Palaskas, T., & Botsaris, C. (2020). Attitude toward entrepreneurship, perceived behavioral control, and entrepreneurial intention: dimensionality, structural relationships, and gender differences. *Journal of Innovation and Entrepreneurship*, 9, 1-26.
- Venkatesh, V., Morris, M. G., & Ackerman, P. L. (2000). A longitudinal field investigation of gender differences in individual technology adoption decision-making processes. *Organizational Behaviour and Human Decision Processes*, 83(1), 33-60.
- Walter, S. G., & Block, J. H. (2016). Outcomes of entrepreneurship education: An institutional perspective. *Journal of Business Venturing*, 31(2), 216–233. <https://doi.org/10.1016/j.jbusvent.2015.10.003>
- 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.
- Zhang, Y., Duysters, G., & Cloudt, M. (2014). The role of entrepreneurship education as a predictor of university students' entrepreneurial intention. *International Entrepreneurship and Management Journal*, 10(3), 623–641. <https://doi.org/10.1007/s11365-012-0246-z>
- Zhuang, J., & Sun, H. (2023). Impact of institutional environment on entrepreneurial intention: The moderating role of entrepreneurship education. *The International Journal of Management Education*, 21(3), 100863.