

Navigating the startup spirit: University students' path to entrepreneurship

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Abstract

Entrepreneurship is a key driver of economic growth, with university students playing a pivotal role in fostering innovation and new ventures. This study examines the entrepreneurial intention (EI) of Malaysian university students through the lens of the Theory of Planned Behavior (TPB), emphasizing the mediating role of entrepreneurial alertness (EA). Using data from 400 undergraduates and recent graduates, this research investigates how entrepreneurial passion (EP), entrepreneurship education (EE), family factor (FF), peer influence (P), entrepreneurial self-efficacy (ESE), and access to financial resources (ATFR) shape EI. Structural Equation Modeling (SEM) revealed three critical findings: (1) EP, EE, P, and ESE positively influence EI, with EA amplifying these effects; (2) FF and ATFR negatively impact EI, without mediation by EA; and (3) attitude is the most influential antecedent of EI. These findings highlight the need for universities and policymakers to foster a supportive entrepreneurial ecosystem, addressing cultural and contextual challenges unique to Malaysia. This study contributes new insights into the factors shaping EI in emerging economies, offering actionable recommendations for enhancing student entrepreneurship.

Keywords: Entrepreneurship, Entrepreneurial intention, Entrepreneurial alertness, University students, Theory of planned behavior, Developing countries.

Introduction

Entrepreneurship is a fundamental driver of modern economies and closely tied to national economic performance (Vazquez-Rozas et al., 2010). As a pathway to self-employment and firm ownership, it stimulates job creation and economic growth (Gieure et al., 2019), while promoting independence, flexibility, career satisfaction, productivity, and quality of life (Kritikos, 2014). Given these benefits, entrepreneurship has the potential to address socio-economic challenges, promote inclusive development, and support equitable national development.

Young adults and university graduates represent a vital demographic in the entrepreneurial ecosystem due to their education, skills, and enthusiasm for new ventures. This group often demonstrates key entrepreneurial traits such as a proactive mindset (Jung and Lee, 2020), a willingness to experiment (Mukhtar et al., 2021), and risk-taking and future-oriented attitudes (Cui et al., 2021).

Entrepreneurship drives the growth of micro, small, and medium enterprises (MSMEs) in developing countries. In Malaysia, MSMEs constitute 97% of startups, provide 48% of employment, and contribute 38% to Gross Domestic Product (GDP) (Krishnan and Rani, 2024). Recognizing this strategic role, entrepreneurship has been positioned as a key economic pillar and a viable career option for graduates (Suhaimi, 2023), particularly amid rising graduate unemployment (Loheswar, 2024; Gan et al., 2024). Consequently, entrepreneurship education (EE) has been integrated into many higher education curricula as core or elective courses, often through industry partnerships that merge academic learning with practical experience to develop essential skills and entrepreneurial intention (Rahim et al., 2015; Khairuddin et al., 2023; Liguori et al., 2020).

Research on entrepreneurial intention (EI) among university students has expanded considerably, focusing on factors such as alertness, education, social influences, and self-efficacy. However, findings remain inconclusive (Carpenter and Wilson, 2022; Shneor et al., 2021; Nowiński et al., 2019). While some studies associate EE with more favorable perceptions of entrepreneurship (Alharbi et al., 2018; Taatila, 2010), others report inconsistent effects on EI (Oosterbeek et al., 2010). These discrepancies highlight the need for further investigation, particularly in developing countries such as Malaysia (Premand et al., 2016; Teoh et al., 2024; Zreen et al., 2019).

This study replicates and extends prior research to strengthen understanding of entrepreneurial intention (EI) among Malaysian university graduates. It addresses a critical gap by investigating entrepreneurial alertness (EA) as a mediating factor. Guided by the Theory of Planned Behavior (TPB) (Ajzen, 1991), the study explores how attitudes, subjective norms, and perceived behavioral control shape EI through EA. Although TPB is widely applied in EI research, EA's mediating role remains underexplored, particularly in Malaysia. Existing studies emphasize direct TPB constructs or other mediators, such as entrepreneurial self-efficacy, while neglecting EA's potential to link TPB antecedents with EI. As EA functions as a cognitive mechanism for recognizing and exploiting opportunities (Heinemann et al., 2022; Nayak et al., 2024), addressing this gap strengthens the connection between opportunity recognition and EI, thereby enhancing TPB's explanatory power in entrepreneurship research.

Unlike most prior studies with limited samples, this present study includes respondents from universities nationwide, ensuring broader representation. It aimed to achieve the following objectives:

- a) To investigate the relationships between entrepreneurial passion (EP), entrepreneurship education (EE), family factor (FF), peer influence (P), entrepreneurial self-efficacy (ESE), and access to financial resources (ATF) and entrepreneurial intention (EI), among university students in Malaysia.
- b) To examine the mediating role of entrepreneurial alertness (EA) in the relationships between attitude and entrepreneurial intention (EI), subjective norm and entrepreneurial intention (EI), and perceived behavioral control and entrepreneurial intention (EI) among university students in Malaysia.

The paper proceeds as follows: it presents the theoretical framework, constructs, and hypotheses, followed by methodology, results, discussions, and implications on Asian businesses. It concludes with study limitations and future research directions.

Literature Review

Entrepreneurial Intention and Theory of Planned Behavior

Entrepreneurial intention (EI) is widely studied through Ajzen's (1991) Theory of Planned Behavior (TPB). Although TPB effectively predicts economic behaviors like entrepreneurship (Kautonen et al., 2013), its linear framework may oversimplify the complex decision-making process. While EI is regarded as a key precursor to entrepreneurial behavior (Bogatyreva et al., 2019; Esfandiar et al., 2019), the persistent intention-behavior gap suggests that EI alone cannot fully explain entrepreneurial outcomes. TPB's core constructs, namely attitude, subjective norms, and perceived behavioral control, are influential, with attitude often identified as the strongest predictor (Amofah and Saladrighes, 2022). However, the relative impact of these factors varies across contexts, and subjective norms may be more salient in collectivist cultures like Malaysia, though this is underexplored.

Recent studies have extended TPB by incorporating contextual and psychological factors. For example, EE has been shown to influence EI mainly through attitude (Kaur and Chawla, 2024). However, mediators such as EA remain largely unexplored. Individual traits and institutional support have been emphasized as modifiers of perceived behavioral control, though in-depth studies are lacking (Bharti et al., 2024). Self-efficacy and pandemic-related effects have also been highlighted, suggesting the need to incorporate environmental contingencies into TPB frameworks (Chahal et al., 2024). These findings affirm TPB's relevance while revealing limitations in addressing dynamic entrepreneurial contexts.

In summary, while TPB offers a solid foundation for EI research, critical gaps remain: limited integration of mediators like entrepreneurial alertness, insufficient cultural contextualization, and inadequate explanation of the intention-behavior gap. Addressing these gaps is vital for a more comprehensive understanding of entrepreneurial intention, especially in developing countries like Malaysia.

Factors Influencing Entrepreneurial Intention

As illustrated in Figure 1, our research model maps each antecedent construct to the corresponding constructs of the Theory of Planned Behavior (TPB), as follows: Attitudes is represented by entrepreneurial passion (EP) and entrepreneurship education (EE); Subjective Norms by family factor (FF) and peer influence (P); and Perceived Behavioral Control by entrepreneurial self-efficacy (ESE) and access to financial resources (ATFR). The discussions on the relevant constructs and hypotheses development are as follows:

Attitude: EP and EE

According to TPB (Ajzen, 1991), attitude toward a behavior reflects an individual's positive or negative evaluation of performing that behavior, namely, entrepreneurship as a career choice. EP, defined as a strong affective commitment to entrepreneurial activities (Cardon et al., 2009), can be conceptualized as a key emotional driver shaping this attitude. EP fosters persistence, creativity, and resilience, which are essential for entrepreneurial success and thus positively influence the formation of favorable attitudes toward entrepreneurship. Empirical evidence supports that students with high EP exhibit stronger entrepreneurial intentions (Biraglia and Kadile, 2017), and prioritize innovation, reinforcing their positive attitudes and intentions (Baron and Tang, 2011; Ma et al., 2017; Karimi, 2020). Therefore, EP can be seen as an antecedent that strengthens the attitudinal component of TPB, ultimately enhancing EI.

Similarly, EE shapes attitudes by strengthening cognitive processes related to entrepreneurial knowledge, skills, and experiential learning, thereby enhancing confidence and perceptions of entrepreneurship (Fayolle and Gailly, 2015; Wu et al., 2022). EE also improves self-efficacy and practical competencies (Liñán et al., 2010; Shinnar et al., 2012), while reinforcing entrepreneurship as a viable career path (Sun et al., 2023; Brüne and Lutz, 2020). Thus, EE functions as an attitudinal catalyst within the TPB framework, fostering stronger EI.

Hence, this study proposes that:

- H1** Entrepreneurial passion (EP) positively affects entrepreneurial intention (EI).
- H2** Entrepreneurship education (EE) positively affects entrepreneurial intention (EI).

Subjective Norms: FF and P

Subjective norms reflect social pressure from family and peers to engage in entrepreneurship. Cultural and social norms within the family, along with economic conditions, create a supportive environment for potential entrepreneurs (Nguyen, 2017). Families that encourage risk-taking and value entrepreneurship positively influence EI (Shirokova et al., 2016). Family support, including financial resources, emotional encouragement, and mentorship, plays a crucial role in fostering EI, particularly for students from entrepreneurial backgrounds (Molina, 2020).

Peer influence often has a direct impact on EI. Supportive peers can provide

collaboration, advice, and shared risk-taking, motivating individuals to pursue entrepreneurship (Wentzel, 2017). Among university students, peer networks enhance EI by fostering encouragement, learning (Liñán and Santos, 2007), and a motivating environment (Falck et al., 2012; Martins et al., 2023) that can significantly influence EI (Lingappa et al., 2020). Therefore, this study considers FF and P as subjective norms that are significant antecedent of EI.

Hence, the study proposes:

H3 Family factor (FF) positively affects entrepreneurial intention (EI).

H4 Peer influence (P) positively affects entrepreneurial intention (EI).

Perceived Behavioral Control: ESE and ATFR

Perceived behavioral control reflects an individual's confidence in their ability to engage in entrepreneurship (Ajzen, 1991). ESE, defined as the belief in one's ability to successfully perform entrepreneurial tasks, is a key determinant (Johnson, 2001). Since entrepreneurship involves recognizing opportunities, mobilizing resources, and taking timely action (Stephens et al., 2013), self-efficacy plays a critical role in shaping EI. Research suggests that individuals with high ESE are more inclined to pursue entrepreneurial opportunities and persist despite obstacles, thereby increasing their likelihood of entrepreneurial success (Liu et al., 2019; Wei et al., 2020).

An individual's ATFR, traditionally considered a facilitator of entrepreneurship, presents a more nuanced relationship with EI (Kraaijenbrink et al., 2010). While financial support is often considered a prerequisite for venture creation (Singh Sandhu et al., 2011), recent findings suggest that its direct influence on EI may not always be positive (Ohanu et al., 2020; Ohanu and Shodipe, 2021). For instance, Alshebami and Al Marri (2022) found that ATFR alone does not necessarily translate into higher EI. Other studies indicate that while financial resources can improve business performance (Gimmon and Levie, 2010), their role in shaping students' EI remains debated (Rusu et al., 2022). Therefore, this study considers ESE and ATFR as perceived behavioral control, that are significant factors influencing EI.

Hence, the study proposes:

H5 Entrepreneurial self-efficacy (ESE) positively affects entrepreneurial intention (EI).

H6 Access to financial resource (ATFR) positively affects entrepreneurial intention (EI).

EA as Mediator

Entrepreneurial alertness (EA) reflects an individual's ability to recognize, assess, and act upon entrepreneurial opportunities (Gaglio and Winter, 2017). Beyond merely facilitating opportunity recognition, EA acts as a cognitive enabler and behavioral driver, equipping individuals with the skills and awareness necessary to transform opportunities into entrepreneurial endeavors (Lanivich et al., 2022; Sharma, 2018). As

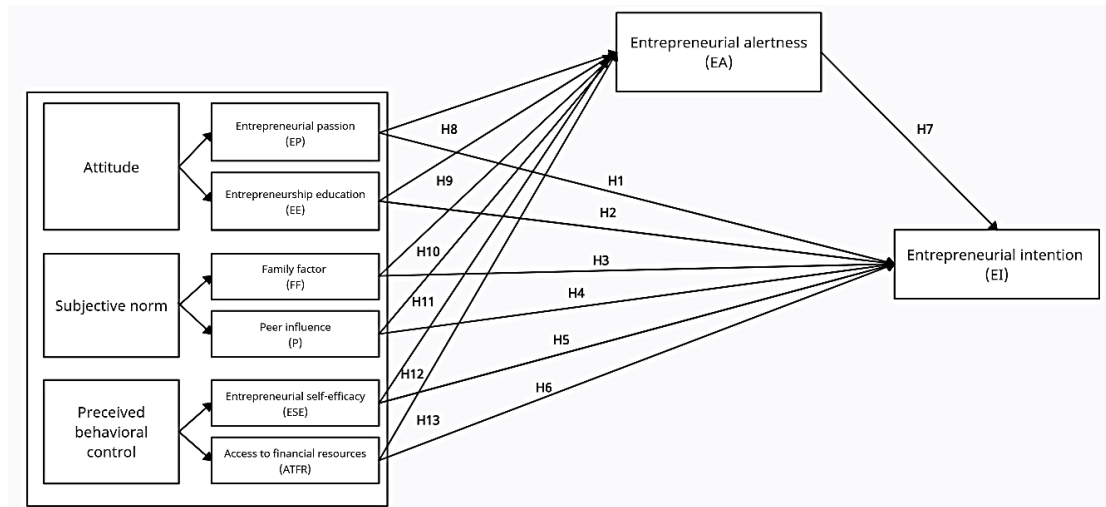
such, it plays a significant mediating role in connecting key antecedents such as attitude, subjective norms, and perceived behavioral control, to EI (Tang et al., 2012).

The growing body of EA research highlights its ability to translate personal traits, social interactions, and prior knowledge into actionable opportunities (Read et al., 2016). For instance, EA and learning jointly mediate the relationship between prior knowledge and opportunity identification (Hajizadeh and Zali, 2016). Likewise, individuals with heightened EA are more likely to engage in entrepreneurial activities, reinforcing its function as a catalyst for EI (Baron, 2006; Obschonka et al., 2013).

In opportunity creation theory, EA functions as an indirect mechanism, enabling entrepreneurs to adapt to environmental changes and leverage personal and social resources effectively (Valliere, 2013). Its significance as a mediator is particularly relevant in developing countries like Malaysia, where the interplay between environmental and individual factors in shaping entrepreneurial behavior remains underexplored. Integrating EA as a mediating variable enables better understanding of how cognitive and contextual factors synergize to influence EI. Thus, we postulate that EA mediates the impact of TPB antecedents on students' EI.

Hence, the study proposes:

- H7** Entrepreneurial alertness (EA) positively affects entrepreneurial intention (EI).
- H8** The relationship between entrepreneurial passion (EP) and entrepreneurial intention (EI) is mediated by entrepreneurial alertness (EA).
- H9** The relationship between entrepreneurship education (EE) and entrepreneurial intention (EI) is mediated by entrepreneurial alertness (EA).
- H10** The relationship between family factor (FF) and entrepreneurial intention (EI) is mediated by entrepreneurial alertness (EA).
- H11** The relationship between peer influence (P) and entrepreneurial intention (EI) is mediated by entrepreneurial alertness (EA).
- H12** The relationship between entrepreneurial self-efficacy (ESE) and entrepreneurial intention (EI) is mediated by entrepreneurial alertness (EA).
- H13** The relationship between access to financial resources (ATFR) and entrepreneurial intention (EI) is mediated by entrepreneurial alertness (EA).

Figure 1: Research model

Methodology

Research Design

A quantitative research design was adopted to implement the study. A cross-sectional survey of recent Malaysian university graduates was conducted to assess their entrepreneurial attitudes, subjective norms, perceived behavioral control, and EI. The research followed a three-phase approach: preliminary decision-making, pre-test and pilot testing, and the main study, ensuring content validity and reliability of survey instruments.

Sampling and Data Collection

A quota sampling method was adopted to ensure adequate representation of key subgroups, specifically students enrolled in tertiary education institutions. Quota sampling approach is suitable for large-scale social research and ensures better representation of key subgroups to improve data quality. As a non-probability method, quota sampling is limited by selection bias due to non-random respondent selection. However, this approach allows practical feasibility within resource constraints (Etikan et al., 2015). To ensure adequate statistical power and model reliability, sample size of 400 respondents was targeted. This exceeds established guidelines, such as Cohen's (1988) minimum of 80–100 cases and Hair et al.'s (2017) '10-times rule' in PLS-SEM, and supports robust path analysis, as recommended by Akter and Hani (2011). The chosen sample size enhances generalizability, parameter stability, and accounts for possible data loss. Drawing from Ministry of Higher Education Malaysia data (2023), the targeted 400-student sample was proportionately distributed across public and private universities in West and East Malaysia. As shown in Table 1, the target respondent was derived from: (i) West Malaysia (90%) – 360 respondents (public universities: 176; private universities: 184); and (ii) East Malaysia (10%) – 40 respondents: (public universities: 30; private universities: 10). Data collection was conducted online via Qualtrics, enhancing accessibility and convenience (Rowley, 2014). The response rate was about 30% (Baruch and Holtom, 2008). Responses were screened for completeness and consistency to ensure reliability.

Table 1: Calculation of quota sampling

Quota	Total student population	% of total population	Total sample (% × 400)
(a) Public university students in West Malaysia	743,901	44%	176
(b) Private university students in West Malaysia	775,421	46%	184
(c) Public university students in East Malaysia	118,990	7.5%	30
(d) Private university students in East Malaysia	41,612	2.5%	10
Total	1,679,924	100%	400

Note: Data retrieved from MoHE (2023)

Instrumentation

A structured questionnaire was developed to measure the study's key constructs, using a seven-point Likert scale (1 = Strongly Disagree to 7 = Strongly Agree). The first section captured demographic data (age, gender, field of study, ethnicity, and state of residence), while the second contained adapted measurement items for independent and dependent variables.

EI was measured using Liñán and Chen (2009), EP from Cardon et al. (2013), and EE from Hytti et al. (2010), Kraaijenbrink et al. (2009), and Trivedi (2016). FF items were adapted from Romani et al. (2022), P from Falck et al. (2012) and Lingappa et al. (2020), and ESE from Guerrero et al. (2009), Grundstén (2004), Autio et al. (2001), and Liñán and Chen (2009). ATFR was measured using Matshekga and Urban (2013) and Farrukh et al. (2017), while EA used Tang et al. (2012). A marker variable from Miller and Chiodo (2008) was included to detect Common Method Bias.

Pre-Test and Pilot Test

A two-stage instrument validation was conducted on the measurement items. The pre-test stage comprised ten individuals who reviewed the initial questionnaire to assess clarity, structure, and content validity (Parsons et al., 2014). Subsequently, in the pilot test, the refined questionnaire from the pre-test was administered online to 50 participants to evaluate reliability and performance (Hill, 1998; Anderson and Gerbing, 1991). Using SPSS version 27 and SmartPLS 4.0, data screening and reliability tests were conducted on the dataset from pilot test. All responses were complete, with no missing or negatively worded items. No univariate outliers were found, while one multivariate outlier was removed based on Mahalanobis Distance, yielding 49 valid cases. Cook's Distance confirmed no further outliers. Reliability was assessed using Cronbach's Alpha, with all constructs achieving $\alpha > 0.7$, except for EI, which required item revision. Construct validity was evaluated using outer loadings and Average

Variance Extracted (AVE). One item (EI1) had a low loading (< 0.5) and was flagged for revision. The questionnaire sequence was revised (dependent $\rightarrow$ mediator $\rightarrow$ independent $\rightarrow$ demographics) to minimize bias, and unclear items were reworded for better clarity and accuracy. To avoid response bias, respondents who participated in the pilot test were excluded from the main study (Hufnagel and Conca, 1994).

Data Analysis

Hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0. This approach enabled evaluation of the measurement model's reliability and validity, while path analysis enabled examination of both direct and indirect relationships, with particular attention to the mediating role of EA. Internal consistency was initially assessed using Cronbach's alpha, followed by composite reliability, which provides a more robust measure. Convergent validity was evaluated through the Average Variance Extracted (AVE), with values above 0.50 indicating sufficient shared variance among items within each construct. Discriminant validity was established using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio, ensuring that each construct was empirically distinct. Bootstrapping procedures were conducted to assess the significance of the structural path coefficients.

Results

Measurement Model

In measurement model, reliability and validity were assessed first by calculating composite reliability (CR), average variance extracted (AVE), and indicator reliability. The CR values ranged from 0.764 to 0.878, exceeding the acceptable threshold of 0.7, indicating strong internal consistency reliability (Table 2). Similarly, the AVE values ranged from 0.501 to 0.672, surpassing the recommended minimum value of 0.5 and confirming convergent validity. Additionally, all factor loadings were above 0.6, providing further evidence of the constructs' reliability. The research also assessed discriminant validity through cross-loading analysis, with all measurement items (EP, EE, FF, P, ESE, ATFR) exhibiting values greater than 0.50, except for ATFR3. ATFR3 was removed in order to achieve the reliability test.

This study also applied the Fornell-Larcker criterion (Fornell and Larcker, 1981) to assess the discriminant validity of the constructs. According to this criterion, the square root of the AVE for each construct should exceed its correlation with any other latent variable. As shown in Table 3, the results confirm the model's discriminant validity, as the square root of the AVE for each construct is greater than the corresponding inter-construct correlations.

Structural Model

The structural model was evaluated for collinearity and predictive accuracy. According to Hair et al. (2014), the model passes the collinearity test if the Variance Inflation Factor (VIF) is less than 5.00. In this study, all variables had VIF coefficient values ranging from 1.040 to 1.929, indicating the absence of collinearity among the constructs.

The model's predictive accuracy was assessed using the R-square (R^2) values, which indicate the proportion of variance explained by the independent variables. The hypotheses testing was conducted using the SEM method with 10,000 bootstrap samples and a significance level of 0.05 in one tailed test. As shown in Table 4, five hypotheses were supported while two hypotheses were not supported, suggesting areas for further exploration and discussion. Additionally, this study reports R^2 values of 0.426 for entrepreneurial intention and 0.445 for entrepreneurial alertness as shown in Figure 2. Based on established guidelines, both values are considered substantial, indicating that the research model explains a significant portion of the variance in these variables (Hair et al., 2017).

Mediation Analysis

According to Henseler et al. (2009), assessing the direct and indirect relationship between exogenous and endogenous latent variable is another important evaluation of a structural model. This study followed the suggestion of Preacher and Hayes (2004) and Preacher and Hayes (2008) by bootstrapping the indirect effect. Moreover, to obtain specific indirect (v) effect sizes, study followed Lachowicz et al. (2018), which is to square the standardized v effects. Table 5 shows the results of mediation analysis.

Table 2: Results of measurement model

Constructs	Indicators	Indicator Reliability, Outer Loadings	Internal Consistency Reliability, Composite Reliability (>0.7)	Convergent Validity, AVE (>0.5)
Entrepreneurial Intention (EI)	EI1	0.959	0.878	0.672
	EI2	1.031		
	EI3	0.968		
	EI4	1.031		
	EI5	1.012		
Entrepreneurial passion (EP)	EP1	1.037	0.791	0.542
	EP2	1.021		
	EP3	1.029		
	EP4	0.891		
	EP5	1.013		
Entrepreneurship Education (EE)	EE1	1.160	0.856	0.614
	EE2	0.973		
	EE3	1.042		
	EE4	0.929		
	EE5	0.848		
Family Factor (FF)	FF1	0.908	0.840	0.504
	FF2	1.172		
	FF3	1.008		
	FF4	0.760		
	FF5	0.938		
Peer Influence (P)	P1	0.908	0.781	0.529
	P2	1.172		
	P3	1.008		
	P4	0.760		
	P5	0.938		

Constructs	Indicators	Indicator Reliability, Outer Loadings	Internal Consistency Reliability, Composite Reliability (>0.7)	Convergent Validity, AVE (>0.5)
Entrepreneurial Self-Efficacy (ESE)	ESE1	1.097	0.764	0.501
	ESE2	1.076		
	ESE3	0.784		
	ESE4	1.009		
	ESE5	0.974		
Access to Financial Resources (ATFR)	ATFR1	1.108	0.829	0.561
	ATFR2	0.730		
	ATFR4	0.809		
	ATFR5	1.110		
Entrepreneurial Alertness (EA)	EA1	1.007	0.783	0.532
	EA2	0.969		
	EA3	1.014		
	EA4	1.003		
	EA5	1.005		

Table 3: Results of Fornell Larcker's Criterion

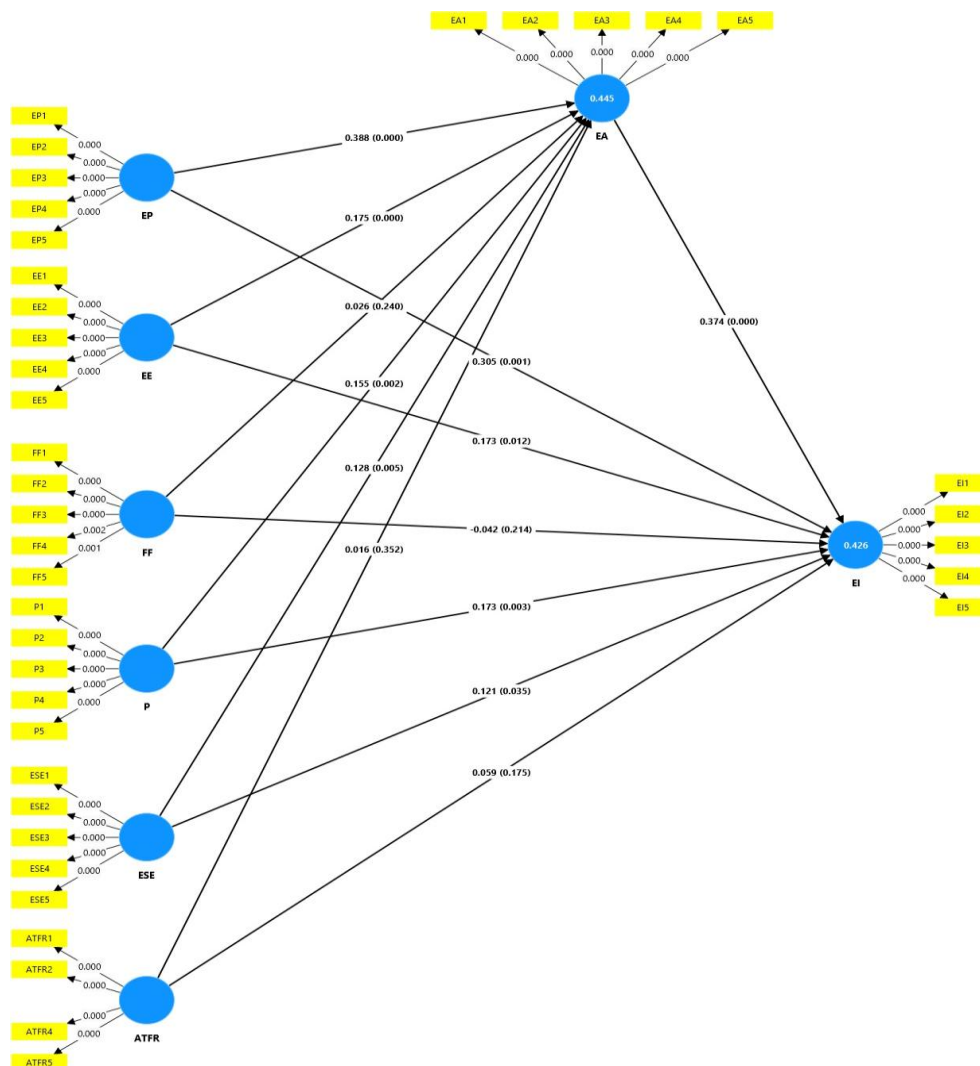
	ATFR	EA	EE	EI	EP	ESE	FF	P
ATFR	0.749							
EA	0.285	0.730						
EE	0.318	0.546	0.784					
EI	0.292	0.562	0.512	0.820				
EP	0.349	0.595	0.593	0.542	0.736			
ESE	0.308	0.375	0.368	0.352	0.344	0.708		
FF	0.027	0.123	0.153	0.070	0.081	0.149	0.710	
P	0.283	0.454	0.525	0.436	0.427	0.326	0.133	0.751

Table 4: Hypothesis Testing

Hypothesis	Std. Beta	Std. Dev	t-value	p-value	PCI LL	PCI UL	f ²	Decision
H1: EP → EI	0.305	0.094	3.245	P<.001	0.093	0.383	0.046	Supported
H2: EE → EI	0.173	0.076	2.261	0.012	0.036	0.358	0.028	Supported
H3: FF → EI	-0.042	0.054	0.792	0.214	-0.016	-0.109	0.002	Unsupported
H4: P → EI	0.173	0.063	2.744	0.003	0.026	0.281	0.033	Supported
H5: ESE → EI	0.121	0.067	1.811	0.035	0.017	0.184	0.039	Supported
H6: ATFR → EI	0.059	0.064	0.935	0.175	-0.022	0.155	0.002	Unsupported
H7: EA → EI	0.374	0.073	5.091	P<.001	0.193	0.434	0.091	Supported

Table 5: Mediation Analysis

Hypothesis	Std. Beta	Effect Size	Std. Error	t-value	p-value	BCI LL	BCI UL	Decision
H8: EP → EA → EI	0.388	Medium	0.038	3.85	<.001	0.084	0.232	Supported
H9: EE → EA → EI	0.175	Small	0.022	2.983	0.003	0.03	0.119	Supported
H10: FF → EA → EI	0.026	None	0.014	0.696	0.487	-0.023	0.035	Unsupported
H11: P → EA → EI	0.155	Small	0.023	2.502	0.012	0.019	0.113	Supported
H12: ESE → EA → EI	0.128	Small	0.021	2.254	0.003	0.012	0.096	Supported
H13: ATFR → EA → EI	0.016	None	0.016	0.374	0.708	-0.028	0.038	Unsupported

Figure 2: R² value for mediator and independent variable

Discussion

Positive Effects of EP, EE, P, and ESE on EI

In line with the study's objectives, our findings demonstrate that all hypothesized direct and mediated relationships between the antecedents and entrepreneurial intention (EI) were supported, except for family support (FF) and access to financial resources (ATFR). Both direct and mediating effects of the TPB constructs were also validated. Among these, attitude emerged as the most influential predictor of EI among Malaysian university students.

Our results confirm the significant positive influence of entrepreneurial passion (EP), entrepreneurship education (EE), peer influence (P), and entrepreneurial self-efficacy (ESE) on EI, aligning with previous research on the multifaceted drivers of entrepreneurial behavior (Cardon et al., 2009; Pham et al., 2023). Our findings also contribute nuanced insights into how these factors operate within the TPB framework.

Attitude was identified as the strongest predictor of EI, consistent with Ajzen's (1991) TPB, where attitude incorporates both cognitive (EE) and affective (EP) dimensions. The effect of EP reinforces the critical role of emotional engagement in forming entrepreneurial goals (Cardon et al., 2009; Kiani et al., 2021). Even among students without prior entrepreneurial exposure, passion enhances belief in the benefits of self-employment, such as autonomy and fulfilment (Baluku et al., 2018) and fosters a deeper emotional interest in entrepreneurship.

The influence of EE further emphasizes its dual role in shaping attitudes and cognitive readiness for entrepreneurship. EE equips students with knowledge and skills and cultivates cognitive frameworks conducive to entrepreneurial pursuits (Law and Breznik, 2017; Jena, 2020). Our findings support the growing body of evidence demonstrating EE's positive impact on EI and performance (Otahe et al., 2021; Debarliev et al., 2022; Osman and Yatam, 2024), reinforcing that both rational and affective components contribute to intention formation.

Subjective norms, represented by P and FF, produced varied outcomes. Peer influence emerged as a significant driver, confirming the social embeddedness of entrepreneurship (Wardana et al., 2024). Peers provide emotional support, social capital, and practical knowledge, which are vital for opportunity recognition and mobilization (Murad et al., 2024). In collectivist societies like Malaysia, such norms are pivotal in shaping entrepreneurial thinking and behavior.

PBC, corresponding to ESE and ATFR, also displayed mixed effects. ESE emerged as another key determinant, highlighting the role of perceived behavioral control. Students with high ESE view entrepreneurship as achievable and desirable, thereby reducing the psychological barriers to venture creation (Liu et al., 2019). Enhancing ESE should thus be a priority in entrepreneurship programs, as it directly influences the likelihood of translating intentions into actions.

Negative Effects of FF and ATFR

Contrary to prevailing assumptions, this study found that FF and ATFR negatively

influence EI, challenging models that consider these factors as inherently supportive.

The negative impact of FF may reflect socio-cultural norms prioritizing job stability over entrepreneurial risk. In Malaysia, secure employment in government or established sectors is traditionally viewed as more prestigious (Qin and Chen, 2023). As a result, family support may inadvertently discourage entrepreneurship, especially when role models within the family are absent (Ishak and Ishak, 2015; Kumar et al., 2022; Cardella et al., 2019). The desire for autonomy may also drive students away from family-based ventures, weakening familial influence on EI (Marques et al., 2012). These findings highlight that family support is contextually dependent and may not always encourage entrepreneurial pursuits.

Similarly, the negative relationship between ATFR and EI questions the assumption that financial capital automatically facilitates entrepreneurship. While necessary, excessive reliance on financial support can undermine entrepreneurial traits such as creativity, resilience, and adaptability (Vuong et al., 2016). This is consistent with Sesen (2013), who found that financial support does not significantly boost students' EI. Students may perceive financial resources as inaccessible or insufficient, making intrinsic and non-financial factors more influential. Within the wider discourse, our findings call for a shift toward more holistic frameworks that emphasize psychological and social capital over mere financial access in supporting entrepreneurship.

Mediating Role of EA

The study confirms that entrepreneurial alertness (EA) significantly mediates the relationship between attitude, subjective norms, perceived behavioral control, and EI. EA provides a cognitive mechanism for translating recognition of opportunities into intention, in line with Zhou and Mei (2016).

EA enhances entrepreneurial action by enabling individuals to reassess information and identify opportunities from novel perspectives (Poblete and Mandakovic, 2021; Onwe et al., 2024). Students with high EA are thus more likely to develop EI and initiate venture creation (Hu et al., 2018). The significant mediating effects of EA (H8, H9, H11, H12) highlights its theoretical and practical relevance in strengthening the influence of key antecedents on EI. Integrating EA into EE programs may foster a more opportunity-oriented entrepreneurial mindset (Read et al., 2016).

However, EA did not mediate the effects of FF and ATFR on EI, mirroring their lack of direct influence. This suggests that these factors do not activate the cognitive mechanisms necessary for opportunity recognition. Consistent with Hyder (2023) and Mala et al. (2019), family influence often centers on stability, which may suppress the development of cognitive traits like critical thinking and creativity (Lent et al., 2000). Emotional or moral support alone is insufficient to stimulate EA, especially when family narratives discourage non-traditional careers (Altinay et al., 2012).

Likewise, ATFR did not significantly enhance EA or influence EI through EA. Although financial capital is often emphasized as a critical enabler (Alshebami, 2024; Aragon-Sanchez et al., 2017), Malaysian students may not perceive it as instrumental in evaluating entrepreneurial opportunities (Tang et al., 2012; Li, 2013).

The unexpected negative effects of FF and ATFR suggest the importance of contextualizing entrepreneurial intention within cultural, social, and institutional frameworks. Within the broader debates on entrepreneurship development, our findings advocate for a more nuanced theoretical approach that recognizes the conditional and sometimes counterproductive roles of traditionally assumed enablers. Effective entrepreneurship development must address not only structural support but also cognitive, emotional, and social dimensions that shape students' readiness to pursue entrepreneurial careers.

Theoretically, this study extends TPB in the context of EI. By incorporating EA as a mediator, EI is emphasized as not merely due to personal or social factors but also an individual's ability to recognize and act upon opportunities. Second, it reinforces attitudes, both cognitive and affective, as the most impactful antecedent to EI, while showing that psychological and social influences are more critical in shaping entrepreneurial aspirations than FF and ATFR.

In summary, EP, EE, P and ESE affirm global evidence on EI's cognitive and affective drivers (Cardon et al., 2009; Law and Breznik, 2017), while negative effects of FF and ATFR highlight cultural constraints. These findings stress context-sensitive applications of TPB and confirm EA's mediating role in international debates on opportunity recognition. Together, these insights extend global discourse by emphasizing that entrepreneurial drivers are contextually contingent rather than universally uniform.

Practical Implications for Asian Business

Our findings offer actionable insights for Asian businesses, especially in fast-evolving sectors such as digital banking and e-commerce, which are often key partners to aspiring entrepreneurs. First, given the strong effects of EP, EE, P and ESE on EI, digital banks can leverage this by designing financial products to specifically address the needs of aspiring young entrepreneurs, such as micro-investment tools, low-cost business accounts, and student-friendly crowdfunding platforms. Such services lower barriers to entry and allow students to explore entrepreneurial opportunities while building their financial capacities. In the e-commerce arena, the provision of student entrepreneur hubs in online platforms such as Shopee or Lazada can support young sellers with fee waivers, discounted logistics, or starter kits. Mentorship programs with established online sellers can strengthen confidence and entrepreneurial attitudes, lower psychological and practical barriers and allow students to see entrepreneurship as an accessible and fulfilling career path.

Second, as EE has significant influence on EI, banks can integrate EE into their digital offerings by collaborating with universities to provide financial literacy workshops, gamified learning platforms, and personalized financial planning modules delivered through mobile apps. This enhances students' business acumen and nurtures EA, while establishing banks as trusted partners in the entrepreneurial journey, rather than mere financial service providers. Similarly, e-commerce platforms can provide structured educational resources, such as free online courses on product photography, digital storytelling, and business analytics, to build entrepreneurial skills. These can equip students with market-ready capabilities, ESE and EA.

Third, the significant impact of P on EI suggests that financial solutions can be enhanced by incorporating social features. Digital banks can create leaderboard-style competitions, cooperative investment clubs, or peer-to-peer saving challenges within their apps to promote a sense of community. Banks can leverage young people's innate propensity to learn and act together to boost entrepreneurial motivation and creative group endeavours. Such initiatives that promote cooperation and mutual achievement can also increase consumer loyalty among young business owners. Online peer networks can also be utilized for e-commerce platforms that allow student sellers to collaborate on marketing strategies, share customer insights, and group discount schemes to create viral.

Lastly, as FF and ATFR negatively impact EI, banks can offer flexible financing options and tools to overcome these challenges. For example, collateral-free microloans, AI-driven credit scores tailored for first-time entrepreneurs, students and their families can address family concerns and reduce the stigma associated with risk-taking. In e-commerce, online platforms can reduce upfront costs for young entrepreneurs by introducing flexible commission structures, micro-loans for digital advertising, and "sell first-pay later" schemes which can ease financial pressures and encourage experimentation. These initiatives can increase access to online entrepreneurship and sustain broader participation. These examples from the digital banking and e-commerce sectors align with growing priorities in Asia to ensure inclusive access to entrepreneurship and improve collaborations to build more innovative entrepreneurial systems.

Limitations and Future Research

One limitation of this study is its focus on Malaysian university students, which can limit generalizability to other Asian countries. The cross-sectional design restricts insights into how EI changes over time. Future studies should use longitudinal methods to examine the long-term effects of key variables on EI, involve wider range of participants from Asia, and investigate how institutional regulations, prevailing economic conditions, and cultural norms affect entrepreneurial development. Improving entrepreneurship education and regulatory frameworks can help develop robust, innovation-driven business environments that promote job creation, sustainable growth, and global competitiveness. It will strengthen Asia's position as a major hub for entrepreneurship.

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