

Artificial Intelligence Tool Usage and Entrepreneurial Intentions: A Study of TVET University Students

Sin Kah Chun¹, Hartini Azman^{1*}, Afizan Azman²

¹Faculty of Technology Management and Technopreneurship, University Teknikal Malaysia Melaka

²Faculty of Innovation & Technology, Taylor's University, 47500, Subang Jaya, Selangor

*Corresponding Author

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ABSTRACT

This study examined the influence of artificial intelligence (AI) tool usage on entrepreneurial intentions among Technical and Vocational Education and Training (TVET) university students in Malaysia. Grounded in the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and the Theory of Planned Behavior (TPB), the study aims to identify key factors influencing AI tool usage, determine their relationship with entrepreneurial intention, and identify the most significant predictor. A quantitative research approach was adopted, and data were collected through an online questionnaire from 384 students across four Malaysian TVET universities (UTHM, UniMAP, UMP, and UTEM). The study applied multiple regression analysis and correlation analysis to evaluate the relationships between variables. The findings revealed that hedonic motivation was the strongest and most significant predictor of entrepreneurial intention, followed by subjective norm and effort expectancy. In contrast, performance expectancy showed a significant negative relationship, while perceived AI competencies were not statistically significant. The regression model explained 71.6% of the variance in entrepreneurial intention, indicating strong explanatory power. The results suggested that students were more influenced by enjoyment and social factors rather than perceived usefulness or skill confidence in adopting AI for entrepreneurship. The study concluded that fostering intrinsic motivation and positive social influence is essential in promoting AI-driven entrepreneurial intentions among TVET students, with important implications for curriculum design and policy development.

Keywords: Artificial intelligence tools; Entrepreneurial intention; TVET students; UTAUT2; Theory of Planned Behavior

INTRODUCTION

Artificial intelligence (AI) has rapidly evolved into a transformative technology that is reshaping both education and entrepreneurship. The advancement of AI, particularly in areas such as data analytics, automation, and generative technologies, has enhanced innovation, improved decision-making processes, and increased productivity across various sectors. In higher education, the integration of AI tools has become a growing trend, enabling students to develop critical thinking, opportunity recognition, and creative problem-solving skills. Recent studies have shown that AI adoption in educational settings can significantly strengthen students' entrepreneurial self-efficacy and intentions by facilitating access to real-time information, market insights, and innovative business solutions (Li et al., 2025; Ahmed et al., 2024).

Within the context of Technical and Vocational Education and Training (TVET) universities, the role of AI is particularly significant due to the sector's strong emphasis on applied learning, technical expertise, and industry relevance. In Malaysia, TVET institutions are expected to produce graduates who are not only job-ready but also capable of creating employment through entrepreneurial ventures, in line with national economic and digital transformation agendas. However, despite the increasing availability and accessibility of AI tools, the level of entrepreneurial intention among TVET students remains moderate. This issue is often associated with challenges

such as limited confidence in using AI technologies, lack of exposure to AI-driven business applications, and uncertainty regarding the practical value of AI in entrepreneurial activities (Rahman et al., 2024).

From a theoretical perspective, entrepreneurial intention is influenced by multiple behavioural and technological factors. The Theory of Planned Behavior suggests that attitudes, subjective norms, and perceived behavioural control play a critical role in shaping individuals' intention to engage in entrepreneurship (Ajzen, 1991). Meanwhile, the Unified Theory of Acceptance and Use of Technology 2 highlights that performance expectancy, effort expectancy, and hedonic motivation are key determinants of technology adoption (Venkatesh et al., 2012). With the rapid development of AI, these factors become increasingly relevant in understanding how students perceive and utilise AI tools for entrepreneurial purposes.

Despite the growing global interest in AI and entrepreneurship, empirical research examining how AI tool usage influences entrepreneurial intentions among TVET university students, particularly in the Malaysian context, remains limited. This gap indicates the need for a more comprehensive investigation into the role of AI-related factors in shaping entrepreneurial behaviour among technically skilled students. Therefore, this study aims to examine the influence of AI tool usage on entrepreneurial intentions, determine the relationships between AI-related factors and entrepreneurial intention, and identify the most significant influencing factor. Guided by the integration of the Unified Theory of Acceptance and Use of Technology 2 and the Theory of Planned Behavior, this study adopts a quantitative research approach to provide empirical evidence.

This paper is organised as follows. The next section reviews the relevant literature and theoretical foundations, followed by the research methodology. Subsequently, the findings and discussion are presented, and the final section concludes with key implications and recommendations.

LITERATURE REVIEW

Introduction and Overview

The rapid advancement of artificial intelligence (AI) has significantly transformed higher education, particularly in enhancing innovation, learning efficiency, and entrepreneurial development. In recent years, AI tools such as generative AI, predictive analytics, and intelligent decision-support systems have become increasingly embedded in educational environments. These technologies enable students to perform complex tasks, analyse market trends, and generate innovative business ideas more efficiently. Emerging empirical evidence indicates that AI adoption enhances entrepreneurial self-efficacy, opportunity recognition, and problem-solving capabilities, which are critical determinants of entrepreneurial intention (Li et al., 2025; Ahmed et al., 2024; Hassan et al., 2025).

In entrepreneurship education, AI tools play a crucial role in bridging the gap between theoretical knowledge and practical application. This is particularly relevant in the Technical and Vocational Education and Training (TVET) context, where the emphasis is on applied skills, technological competence, and industry readiness. Despite these developments, recent studies highlight that entrepreneurial intention among TVET students remains moderate, especially in developing economies such as Malaysia. This situation is often attributed to limited AI literacy, lack of confidence in using advanced technologies, and insufficient exposure to AI-driven entrepreneurial practices (Rahman et al., 2024). Consequently, there is a growing need to examine how AI-related factors influence entrepreneurial intention within this specific educational context.

Underpinning Theories

This study is grounded in two prominent theoretical frameworks: the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and the Theory of Planned Behavior (TPB). UTAUT2 explains individuals' intention to adopt technology based on constructs such as performance expectancy, effort expectancy, social influence, and hedonic motivation (Venkatesh et al., 2012). Recent extensions of UTAUT2 have confirmed its relevance in explaining AI adoption behaviour among students, particularly in digital entrepreneurship contexts (Pang et al., 2025; Noerman et al., 2025).

Meanwhile, TPB posits that behavioural intention is influenced by attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). Contemporary studies have expanded TPB by integrating digital competencies

and AI literacy, demonstrating that these factors significantly strengthen entrepreneurial intention by enhancing confidence and perceived control (Duong et al., 2024; Ha et al., 2025). The integration of UTAUT2 and TPB provides a comprehensive framework that captures both technological and psychological determinants, making it highly suitable for examining AI-driven entrepreneurial behaviour among students.

Independent Variables

Perceived AI competencies

Perceived AI competencies refer to an individual's ability and confidence in using AI tools for problem-solving, automation, and innovation. Recent studies consistently highlight its importance in shaping entrepreneurial intention. For instance, Duong et al. (2024) found that AI competencies significantly enhance perceived behavioural control and entrepreneurial intention among MBA students. Similarly, Ha et al. (2025) demonstrated that AI competence positively influences sustainability-oriented entrepreneurial intention by strengthening self-efficacy.

Furthermore, Duong (2025) reported that AI literacy directly and indirectly influences entrepreneurial intention through technological self-efficacy. These findings suggest that students with higher AI competence are more confident in identifying and exploiting entrepreneurial opportunities. Therefore:

H1: Perceived AI competencies has a significant effect on entrepreneurial intention among TVET university students.

Performance expectancy

Performance expectancy refers to the degree to which individuals believe that using AI tools will enhance their performance and productivity. Recent empirical evidence confirms its strong influence on entrepreneurial intention. Studies such as Duong et al. (2024) and Solórzano et al. (2024) found a positive relationship between perceived usefulness of AI and entrepreneurial intention. These findings suggest that when students believe AI can enhance their performance, they are more likely to engage in entrepreneurial activities. Komal Azariah et al. (2023) also reported that students who perceive AI as useful and performance-enhancing are more likely to pursue entrepreneurial ventures. Hence:

H2: Performance expectancy has a significant effect on entrepreneurial intention among TVET university students.

Effort expectancy

Effort expectancy plays a significant role in shaping AI adoption behaviour. Pang et al. (2025) and Izhar et al. (2025) demonstrated that ease of use significantly increases AI adoption among students. These findings are consistent with UTAUT2, which emphasises that technologies perceived as user-friendly are more likely to be adopted.

However, recent studies suggest that the role of effort expectancy may be diminishing as students become more digitally literate. For instance, Noerman et al. (2025) argued that while ease of use is important, it may not be the primary driver of continued usage or entrepreneurial intention. Instead, intrinsic motivation and perceived benefits may play a more dominant role. Thus:

H3: Effort expectancy has a significant effect on entrepreneurial intention among TVET university students.

Subjective Norm

Subjective norm has been consistently identified as a significant predictor of entrepreneurial intention. Studies by Zhang and Jiang (2025) and Sadriwala and Dadhich (2024) confirm that social influence plays a crucial role in shaping AI adoption and entrepreneurial behaviour.

However, the strength of subjective norm varies across contexts. In collectivist societies such as Malaysia, social influence is expected to be stronger compared to individualistic cultures. Despite this, many studies do not

explicitly consider cultural context when analysing subjective norms. Additionally, prior research often treats subjective norm as a direct predictor, without exploring its indirect effects through mediating variables such as attitude or self-efficacy (Pham et al., 2023). Therefore:

H4: Subjective Norm has a significant effect on entrepreneurial intention among TVET university students.

Hedonic motivation

Hedonic motivation has gained increasing attention in recent AI studies, particularly with the rise of generative AI technologies. Kang et al. (2024) and Noerman et al. (2025) found that enjoyment and curiosity significantly enhance user engagement and intention to use AI tools.

Compared to traditional predictors such as performance expectancy, hedonic motivation represents a shift toward intrinsic factors. However, earlier studies (e.g., Upadhyay et al., 2021) treated hedonic motivation as a secondary factor, suggesting that its importance has only recently increased. This indicates a shift in research trends, where intrinsic motivation is becoming more relevant in explaining AI adoption and entrepreneurial behaviour. Thus:

H5: Hedonic motivation has a significant effect on entrepreneurial intention among TVET university students.

Dependent Variable: Entrepreneurial intention

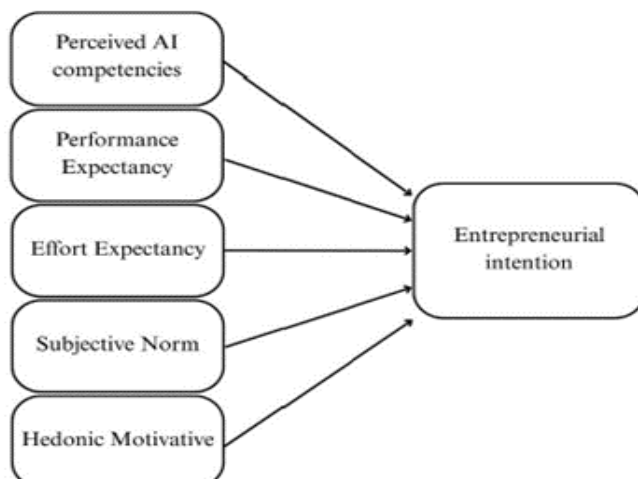
Entrepreneurial intention refers to an individual's conscious plan or willingness to start a business (Koe, 2016). It is widely recognised as the most reliable predictor of actual entrepreneurial behaviour. Recent studies suggest that in the context of AI, entrepreneurial intention is influenced by multiple factors, including AI competence, perceived usefulness, ease of use, social influence, and intrinsic motivation (Solórzano et al., 2024; Nuseir et al., 2020; Abaddi, 2023).

In AI-driven environments, students who perceive AI tools as useful, easy to use, and enjoyable, and who receive strong social support, are more likely to develop stronger entrepreneurial intentions. Therefore, this study positions entrepreneurial intention as the key outcome variable influenced by AI-related predictors.

RESEARCH FRAMEWORK

The research framework of this study integrates key constructs from UTAUT2 and TPB to examine the influence of AI-related factors on entrepreneurial intention. Specifically, perceived AI competencies, performance expectancy, effort expectancy, subjective norm, and hedonic motivation are proposed as independent variables, while entrepreneurial intention serves as the dependent variable. This integrated model reflects the multidimensional nature of AI adoption and its impact on entrepreneurial outcomes. The proposed research framework for this study is illustrated in Figure 1.

Figure 1: Research framework of the study



METHOD

This study employed a quantitative, cross-sectional research design to examine the influence of perceived AI competencies, performance expectancy, effort expectancy, subjective norm, and hedonic motivation on entrepreneurial intention among TVET university students in Malaysia. The study adopted a positivist and deductive approach, with data collected through a structured online questionnaire.

The target population comprised students from four Malaysian public TVET universities: Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Malaysia Perlis (UniMAP), Universiti Malaysia Pahang Al-Sultan Abdullah (UMPASA), and Universiti Teknikal Malaysia Melaka (UTeM), with a combined population of 56,945 students. Based on Krejcie and Morgan (1970), a minimum sample of approximately 382 respondents was required. Stratified random sampling was employed to ensure representation from each institution, resulting in 384 valid responses, with 96 respondents from each university. Respondents were required to have prior experience using AI tools.

Data were collected using a structured Google Forms questionnaire comprising 24 measurement items covering six constructs: perceived AI competencies, performance expectancy, effort expectancy, subjective norm, hedonic motivation, and entrepreneurial intention. Each construct was measured using four items on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The measurement items were adapted from established literature and reviewed by an expert in technology and entrepreneurship to establish content validity. A pilot test involving 40 respondents was conducted prior to the main survey, producing an overall Cronbach's alpha of .957, indicating excellent internal consistency.

For the final sample, the instrument demonstrated satisfactory reliability, with an overall Cronbach's alpha of .952. The construct-level coefficients were .787 for perceived AI competencies, .753 for performance expectancy, .801 for effort expectancy, .705 for subjective norm, .801 for hedonic motivation, and .840 for entrepreneurial intention. All values exceeded the recommended threshold of .70, confirming acceptable internal consistency.

Ethical principles were observed throughout the study. Participation was voluntary, informed consent was obtained, and respondents were informed of their right to withdraw without penalty. No personally identifiable information was collected, and the data were anonymised, securely stored, and reported in aggregate form.

Data were analysed using SPSS. Descriptive statistics, Pearson correlation, and multiple linear regression were employed to examine the relationships between the study variables and determine the unique contribution of each predictor to entrepreneurial intention. Statistical significance was assessed at the .05 level.

ANALYSIS AND RESULTS

Demographic Profile

Table 1: Demographic Profile

	Frequency	Percentage
Gender		
Female	194	50.5%
Male	190	49.5%
Age		
Below 20	39	10.2%
20-22	151	39.3%
23-25	184	47.9%
Above 25	10	2.6%
Ethnic		
Chinese	143	37.2%
Malay	125	32.6%
Indian	116	30.2%

University		
UMPSA	96	25%
UniMAP	96	25%
UTeM	96	25%
UTHM	96	25%
Level of Study		
Diploma	39	10.2%
Bachelor's Degree	335	87.2%
Master's Degree	10	2.6%
Prior AI Exposure		
Yes	100	100%
No	0	0%

The study involved 384 respondents from four Malaysian MTUN universities (UTeM, UTHM, UniMAP, and UMPSA) selected through stratified random sampling. From Table 1, the gender distribution was nearly equal, consisting of 50.5% female and 49.5% male students. In terms of age, the majority were between 23–25 years old (47.9%), followed by those aged 20–22 (39.3%), with smaller proportions below 20 years old (10.2%) and above 25 years old (2.6%). The sample also reflected Malaysia’s multicultural composition, comprising 37.2% Chinese, 32.6% Malay, and 30.2% Indian respondents. Each university contributed 96 students (25%), ensuring balanced institutional representation. Academically, most respondents were pursuing a Bachelor’s degree (87.2%), followed by those at the Diploma (10.2%) and Master’s (2.6%) levels. Importantly, all respondents (100%) reported prior exposure to AI tools, aligning well with the study’s objective of examining AI related entrepreneurial intentions.

Correlations

Table 2: Correlations

		PAC	PE	EE	SN	HM	EI
PAC	Pearson Correlation	1	.822**	.722**	.804**	.797**	.671**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
PE	Pearson Correlation	.822**	1	.697**	.815**	.774**	.654**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
EE	Pearson Correlation	.722**	.697**	1	.708**	.739**	.676**
	Sig. (2-tailed)	.000	.000		.000		.000
SN	Pearson Correlation	.804**	.815**	.708**	1	.772**	.748**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
HM	Pearson Correlation	.797**	.774**	.739**	.772**	1	.818*
	Sig. (2-tailed)	.000	.000	.000	.000		.000
EI	Pearson Correlation	.671**	.654**	.676**	.748**	.818***	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
** Correlation is significant at the 0.01 level (2-tailed).							
Notes: PAC: Perceived AI Competencies, PE: Performance Expectancy, EE: Effort Expectancy, SN: Subjective Norm, HM: Hedonic Motivation, EI: Entrepreneurial Intention							

The findings summarized in Table 2 indicate that all independent variables are positively and significantly correlated with entrepreneurial intention at the 0.01 significance level ($p < 0.01$), suggesting strong associations between AI-related factors and students’ entrepreneurial intention.

Among the variables, hedonic motivation demonstrates the strongest positive relationship with entrepreneurial intention ($r = 0.818$, $p < 0.01$), indicating that students who experience greater enjoyment and engagement in using AI tools are more likely to develop stronger entrepreneurial intentions. This finding highlights the increasing importance of intrinsic motivation in AI adoption and entrepreneurial behaviour.

This is followed by subjective norm ($r = 0.748$, $p < 0.01$), suggesting that social influence from peers, educators, and the surrounding environment plays a significant role in shaping students' entrepreneurial intentions. Meanwhile, effort expectancy ($r = 0.676$, $p < 0.01$), perceived AI competencies ($r = 0.671$, $p < 0.01$), and performance expectancy ($r = 0.654$, $p < 0.01$) also exhibit moderate to strong positive relationships with entrepreneurial intention.

Additionally, the independent variables show high intercorrelations (ranging from 0.697 to 0.822), indicating that these factors are closely related to one another. While this suggests a strong conceptual linkage among AI-related constructs, it may also imply potential multicollinearity, which should be further examined in regression analysis.

Overall, the findings suggest that both technological factors (performance and effort expectancy) and behavioural factors (subjective norm and hedonic motivation) play important roles in influencing entrepreneurial intention, with hedonic motivation emerging as the most influential correlate.

Multiple Regression Analysis

Multiple regression analysis was conducted to examine the effects of perceived AI competencies, performance expectancy, effort expectancy, subjective norm, and hedonic motivation on entrepreneurial intention.

Table 3: Multiple Regression Analysis

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.846 ^a	.716	.712	.38349

The results of the analysis are presented in Table 3. The regression results show that the model has a strong fit ($R = 0.846$). The R^2 value of 0.716 indicates that 71.6% of the variation in entrepreneurial intention is explained by the five independent variables. The adjusted R^2 (0.712) is very close, suggesting the model is reliable and not overfitted. Additionally, the low standard error (0.38349) shows good prediction accuracy. Overall, the findings indicate that the selected factors strongly explain entrepreneurial intention among students.

Coefficients

Table 4 : Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	.286	.139		2.060	.040
	Perceived AI Competencies	-.116	.062	-.106	-1.863	.063
	Performance Expectancy	-.136	.058	-.130	-2.331	.020
	Effort Expectancy	.115	.045	.113	2.561	.011
	Subjective Norm	.407	.060	.370	6.841	.000
	Hedonic Motivation	.639	.053	.634	12.136	.000

As reported in Table 4, four out of the five proposed hypotheses were supported. Hedonic motivation emerged as the most influential predictor of entrepreneurial intention ($\beta = 0.634$, $p < 0.001$), indicating that enjoyment and intrinsic motivation derived from using AI tools play a critical role in shaping students' entrepreneurial intention. Subjective norm also exhibited a strong and positive effect ($\beta = 0.370$, $p < 0.001$), suggesting that social influence from peers, educators, and institutions significantly enhances entrepreneurial intention.

Additionally, effort expectancy showed a positive and statistically significant influence on entrepreneurial intention ($\beta = 0.113$, $p = 0.011$), indicating that perceived ease of using AI tools encourages entrepreneurial engagement. In contrast, perceived AI competencies ($\beta = -0.106$, $p = 0.063$) and performance expectancy ($\beta = -0.130$, $p = 0.020$) exhibited negative coefficient values, with perceived AI competencies failing to reach statistical significance at the 0.05 level. These findings suggest that not all AI-related perceptions directly contribute to entrepreneurial intention when considered simultaneously within the regression model.

Overall, the results indicate that hedonic motivation, subjective norm, and effort expectancy positively influence entrepreneurial intention, while perceived AI competencies and performance expectancy do not exert a positive effect in the multivariate context.

Based on the regression results presented in Table 4, the estimated regression equation is as follows:

$$\text{Entrepreneurial intention} = 0.286 - 0.116 (\text{perceived AI competencies}) - 0.136 (\text{performance expectancy}) + 0.115 (\text{effort expectancy}) + 0.407 (\text{subjective norm}) + 0.639 (\text{hedonic motivation})$$

Hypothesis Testing

Table 5: Hypothesis Testing

Hypothesis	Relationship	Result
H1	Perceived AI Competencies → Entrepreneurial Intention	Not supported
H2	Performance Expectancy → Entrepreneurial Intention	Supported; negative effect
H3	Effort Expectancy → Entrepreneurial Intention	Supported
H4	Subjective Norm → Entrepreneurial Intention	Supported
H5	Hedonic Motivation → Entrepreneurial Intention	Supported

In Table 5, four of the five hypothesised relationships were statistically significant. However, H2 demonstrated a significant effect in the negative direction, whereas H3, H4, and H5 demonstrated positive effects. H1 was not statistically significant.

DISCUSSION

This study examined how AI-related psychological factors influence entrepreneurial intention among TVET university students. The regression model accounted for 71.6% of the variance, demonstrating that these constructs collectively exert a strong influence on students' entrepreneurial motivation. The findings revealed that hedonic motivation is the strongest predictor of entrepreneurial intention ($\beta = 0.634$), indicating that students who find AI tools enjoyable and stimulating are more inclined to consider AI-supported entrepreneurship. This supports earlier findings by Upadhyay (2021) and Kang (2024) who argued that intrinsic enjoyment in AI usage enhances creativity, exploration, and intention to engage in digital entrepreneurship.

The second strongest predictor, subjective norm ($\beta = 0.370$), highlights the critical role of social influence particularly encouragement from peers, lecturers, and mentors in shaping students' entrepreneurial decisions. This is consistent with evidence from Zhang and Jiang (2025) and Pham (2023), who found that supportive academic and social environments reinforce AI-driven entrepreneurial motivation. These results indicate that entrepreneurial activity in AI-rich settings is socially embedded rather than purely individualistic, echoing the conclusions of Adam (2025), who emphasized the influence of collective norms on technology-based entrepreneurial behaviour. Effort expectancy also produced a significant positive effect ($\beta = 0.113$), suggesting that intuitive, user-friendly AI tools increase students' willingness to explore entrepreneurial opportunities. This aligns with Izhar (2025), who reported that reducing technical barriers encourages wider acceptance and deeper engagement with AI systems.

On the other hand, performance expectancy showed a significant negative effect on entrepreneurial intention ($\beta = -.130$, $p = .020$), although its bivariate relationship with entrepreneurial intention was positive and significant ($r = .654$, $p < .001$). This contrasting result suggests that performance expectancy should be interpreted as a unique effect within the multivariate model rather than as a general negative association. The change from a positive correlation to a negative regression coefficient may be attributable to the relatively high intercorrelations among the predictors, particularly performance expectancy with perceived AI competencies ($r = .822$), subjective norm ($r = .815$), and hedonic motivation ($r = .774$). Thus, the negative coefficient may reflect shared variance or a suppression effect after controlling for the other predictors. The finding also indicates that entrepreneurial intention may be influenced more strongly by experiential and social factors, as hedonic motivation ($\beta = .634$, $p < .001$) and subjective norm ($\beta = .370$, $p < .001$) were substantially stronger predictors than performance

expectancy. This unexpected finding suggests that students who recognise the performance benefits of AI may also adopt a more cautious view of the complexity, risks, and responsibilities associated with AI-enabled entrepreneurship. However, this interpretation should be treated cautiously because the cross-sectional quantitative design cannot establish the underlying psychological mechanism. Future research using interviews or focus groups could provide deeper insights into whether students perceive AI performance benefits primarily as entrepreneurial opportunities or as sources of risk, complexity, and competitive pressure.

Similarly, perceived AI competencies showed a significant positive bivariate relationship with entrepreneurial intention ($r = .671, p < .001$), but their unique effect was not statistically significant in the regression model ($\beta = -.106, p = .063$). This suggests that although students who perceive themselves as competent in using AI tend to report higher entrepreneurial intention, AI competence alone does not independently predict entrepreneurial intention when other factors are considered. One possible explanation is that AI competence may function as an enabling condition rather than a primary motivational factor, particularly among students who already have experience using AI tools. Instead, entrepreneurial intention may depend more strongly on enjoyment, social encouragement, and ease of use, as reflected by the stronger effects of hedonic motivation ($\beta = .634$) and subjective norm ($\beta = .370$). The finding suggests that TVET entrepreneurship education should complement technical AI training with experiential learning, social support, and opportunities to apply AI to authentic entrepreneurial activities.

Overall, the results suggest that emotional and social factors particularly enjoyment and social support play more powerful roles in shaping AI-related entrepreneurial intention than purely cognitive or performance-driven considerations. This finding reinforces emerging perspectives that entrepreneurship in AI-enabled environments is driven by curiosity, positive experience, and communal influence rather than technical proficiency alone.

CONCLUSION

This study examined the influence of AI-related factors on entrepreneurial intention among TVET university students in Malaysia using an integrated UTAUT2 and TPB framework. The findings demonstrate that AI-related perceptions collectively provide substantial explanatory power, with the regression model accounting for 71.6% of the variance in entrepreneurial intention. Hedonic motivation emerged as the strongest predictor ($\beta = .634, p < .001$), followed by subjective norm ($\beta = .370, p < .001$) and effort expectancy ($\beta = .113, p = .011$). These findings indicate that enjoyment, social encouragement, and ease of AI use are particularly important in shaping students' entrepreneurial intentions.

The findings also provide two important insights that extend the conventional interpretation of AI adoption. First, perceived AI competencies were positively correlated with entrepreneurial intention but did not demonstrate a statistically significant unique effect in the full regression model ($\beta = -.106, p = .063$). This suggests that technical confidence alone may be insufficient to motivate entrepreneurial intention once motivational and social factors are taken into account. Second, performance expectancy demonstrated an unexpected significant negative regression coefficient ($\beta = -.130, p = .020$), despite having a positive bivariate correlation with entrepreneurial intention ($r = .654, p < .001$). This divergence indicates that the negative coefficient should be understood as a conditional or unique effect within the multivariate model rather than as evidence that perceived AI usefulness generally discourages entrepreneurship. The relatively high correlations among the independent variables also suggest that shared variance may contribute to the reversal in the direction of the regression coefficient.

Theoretically, these findings contribute to UTAUT2 and TPB by demonstrating that entrepreneurial intention in an AI-enabled TVET context may not be driven primarily by instrumental evaluations of technology. Instead, affective and social dimensions appear to play a more dominant role. The strong influence of hedonic motivation suggests that students may be more willing to consider AI-enabled entrepreneurship when interactions with AI are enjoyable, stimulating, and engaging, while the significant effect of subjective norm highlights the importance of social approval and encouragement from peers, lecturers, mentors, and other influential individuals.

Practically, TVET institutions should therefore move beyond technical AI training and incorporate engaging, collaborative, and entrepreneurship-oriented learning experiences. AI-based entrepreneurial projects, experiential activities, peer collaboration, mentorship, and opportunities for students to experiment with AI tools may help

transform technical exposure into entrepreneurial motivation. At the same time, educators should provide critical guidance on the limitations, risks, ethical considerations, and responsible use of AI so that students develop realistic rather than purely instrumental expectations of the technology.

Several limitations should be acknowledged. The study employed a cross-sectional quantitative design and relied on self-reported responses, which limits causal interpretation and may not fully capture students' lived experiences with AI tools. In addition, the sample was restricted to students from four Malaysian public TVET universities, which may limit the generalisability of the findings to other student populations and educational contexts. Most importantly, the quantitative design cannot fully explain the mechanisms underlying the unexpected negative relationship between performance expectancy and entrepreneurial intention.

Based on these limitations, future research should consider mixed-method or qualitative approaches to complement the quantitative findings of this study. Interviews or focus group discussions with TVET students could provide deeper insights into the unexpected negative relationship between performance expectancy and entrepreneurial intention, particularly by exploring students' perceptions of AI-related risks, complexity, ethical concerns, and competitive pressures. Qualitative approaches could also clarify why hedonic motivation emerged as the strongest predictor and how students' enjoyment and experiences with AI influence their entrepreneurial thinking.

Future studies could further employ larger and more diverse samples, longitudinal designs, and extended models incorporating variables such as entrepreneurial self-efficacy, perceived behavioural control, AI anxiety, and perceived risk. Longitudinal research could also examine whether AI-related entrepreneurial intentions translate into actual entrepreneurial behaviour. These approaches would provide a more comprehensive understanding of how AI adoption contributes to entrepreneurial development among TVET students.

In summary, this study demonstrates that emotional enjoyment, social encouragement, and ease of AI use are pivotal forces shaping entrepreneurial intention among TVET students, contributing meaningful evidence for designing more effective AI driven entrepreneurship education. These insights support educators, policymakers, and industry stakeholders in cultivating AI ready entrepreneurial talent and highlight the importance of creating learning environments where AI is not only functional but also engaging and socially supported.

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