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BRIDGING DIGITAL MARKETING LITERACY AND ENTREPRENEURIAL INTENTION: A THEORY OF PLANNED BEHAVIOUR PERSPECTIVE AMONG POLYTECHNIC STUDENTS

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Abstract:

Digital marketing skills can assist students in exploring business opportunity, but it does not necessarily go on to plans to start a business. This study is about the relationship between digital marketing literacy and entrepreneurial intention of polytechnic students. It considers attitude, subjective norms and perceived behavioural control in the Theory of Planned Behaviour (TPB). This research is a quantitative study with cross sectional survey approach that involved 156 students of Polytechnic Hulu Terengganu, Malaysia. Responses were collected using a questionnaire. Digital marketing literacy was measured using three dimensions. Data analysis was performed using partial least squares structural equation modelling (PLS-SEM) and performed in two steps, testing the direct and indirect relationships by bootstrapping. Seven out of 10 hypotheses were accepted. Digital marketing literacy was positively related to entrepreneurial intention ($\beta = 0.404$, $p < 0.000$), attitude ($\beta = 0.517$, $p < 0.001$), and perceived behavioural control ($\beta = 0.453$, $p < 0.001$). Entrepreneurial intention was also found to be positively correlated with attitude ($\beta = 0.226$) and perceived behavioural control ($\beta = 0.133$). Both indirectly contributed to explaining the relationship between digital marketing literacy and entrepreneurial intention with significant relationships. Subjective norms did not have a direct or a mediated relationship. It seems that students' digital marketing knowledge is relevant and goes hand in hand with their perception of entrepreneurship and self-efficacy. The results

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indicated that Polytechnics should integrate the teaching and learning of digital marketing with confidence-enhancing business activities. Because the study was conducted in a single institution with self-reported responses at a single time, the findings are not able to determine cause and effect. Potential future studies might involve a longitudinal study of students and a study of business activity.

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Keyword:

Digital Marketing Literacy; Entrepreneurial Intention, Theory of Planned Behaviour; Polytechnic Students., PLS-SEM

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Introduction

Digital technology has changed how people explore business opportunities, communicate with customers, and promote products and services. Social media, e-commerce platforms, and online marketing tools have made it easier for individuals, including students, to explore business opportunities without some of the barriers associated with traditional businesses. These developments have increased the need for digital marketing literacy, especially among students who may consider entrepreneurship as a future career. Digital marketing literacy refers to the knowledge and skills needed to understand marketing information, use digital tools, and apply suitable strategies to reach customers. Studies have shown that digital competencies are related to entrepreneurial development and may help students identify business opportunities and prepare for entrepreneurial activities (Moorthy & Sahid, 2022; Liang et al., 2025; Ayob et al., 2026). Having digital marketing knowledge, however, does not necessarily mean that students are interested in starting their own businesses.

Entrepreneurship education has been studied as one of the factors associated with students' entrepreneurial intention. Bae et al. (2014), in a meta-analysis of 73 studies, found a small but significant positive relationship between entrepreneurship education and entrepreneurial intention. This relationship became non-significant after considering students' entrepreneurial intentions before they received entrepreneurship education. Similar differences can be seen in more recent studies. Liang et al. (2025) found that practice-oriented entrepreneurship education was related to digital entrepreneurial intention through creativity, while digital literacy influenced the relationship between entrepreneurship education and intention. Ayob et al. (2026) reported that digital literacy was significantly related to entrepreneurial inclination and readiness among Malaysian TVET students. Their study also found that entrepreneurship education was significantly associated with entrepreneurial readiness but not entrepreneurial inclination. These results indicate that there is a link between digital skills and entrepreneurship

education with entrepreneurial development, but the relationships may vary, depending on whether the intention, readiness or behaviour is studied.

The development of digital skills and entrepreneurship education in Malaysia is part of the nation's agenda to build a robust digital economy and equip youth for the job market and entrepreneurship opportunities. Digital development, technological advancement and Technical and Vocational Education and Training (TVET) are declared as national development areas in Thirteenth Malaysia Plan (2026-2030). Polytechnics play their part in these by imparting to students the technical knowledge, practical training and exposure to entrepreneurship. Factors associated with entrepreneurial intention and readiness among Malaysian university, polytechnic and community college students have been explored in studies (Moorthy & Sahid, 2022; Siran et al., 2025; Ayob et al., 2026). The Digital Entrepreneurship module (DTA20152) teaches students at Polytechnic Hulu Terengganu about digital business. The module will introduce the students to digital marketing and business activities, which will not ensure that all students will want to start up a business. There is a possibility that some students are aware of the functioning of digital tools and are not aware about entrepreneurship. This makes it a matter of concern as to what are the factors that are related to their entrepreneurial intention.

The Theory of Planned Behaviour (TPB) as proposed by Ajzen (1991), provides an explanation of how people form intentions to engage in specific actions. According to the theory, there are three factors that affect behavioural intention: attitude towards the behaviour, subjective norms, and perceived behavioural control. Attitude is the attitudes towards a specific behaviour. Subjective norms are the perceived expectations of relevant others and perceived behavioural control is the sense of capability of the person in doing the behaviour. TPB is extensively used in entrepreneurship studies to explain the motivations behind an individual's intention to become an entrepreneur (Ajzen, 1991; Linan & Chen, 2009; Teoh et al., 2024). But the results of research are not always the same between groups of students. Teoh et al. (2024) reported that attitude and perceived behavioural control were significant predictors of entrepreneurial intention, while subjective norms were not significant in explaining entrepreneurial intention among business undergraduate students in Malaysia. Low et al. (2026) found that all three TPB constructs were significantly related to digital entrepreneurial intention among the students of private universities in Malaysia. These findings suggest that students' entrepreneurial intentions may be associated with different psychological factors depending on their educational background and learning environment.

Research has also explored how digital experiences and entrepreneurship education relate to students' attitudes, confidence, and entrepreneurial intention. Awang et al. (2026) found that entrepreneurial attitude and self-efficacy helped explain the relationship between digital entrepreneurship education and digital entrepreneurial intention among Malaysian higher education students. Al Lawati et al. (2026) reported that attitude and perceived behavioural control played mediating roles in the relationship between social media use and entrepreneurial

intention. These studies suggest that digital experiences may relate to entrepreneurial intention through the way students view entrepreneurship and their confidence in carrying out business activities. Digital marketing literacy, however, differs from general digital literacy and everyday social media use. It focuses on applying digital knowledge to marketing activities, understanding customer needs, promoting products, and communicating with potential customers. Students may be comfortable using digital platforms but may not feel equally

prepared to apply those skills to business activities. Although earlier studies have examined digital literacy, entrepreneurship education, and psychological factors, the specific role of digital marketing literacy in explaining entrepreneurial intention within the TPB framework still needs further examination. This is especially true for students of Polytechnics completing formal digital entrepreneurship module.

Based on the TPB, this study explores the digital marketing literacy and entrepreneurial intention relationship among polytechnic students. It highlights attitude toward entrepreneurship, subjective norms and perceived behavioural control as factors related to entrepreneurial intention. Digital marketing literacy is included as an additional explanatory variable to examine whether it offers further understanding of entrepreneurial intention beyond the original TPB constructs. By examining these relationships, the study seeks to provide evidence from the Terengganu polytechnic context and improve understanding of how digital marketing knowledge relates to students' decisions about entrepreneurship. The findings may also help TVET educators develop entrepreneurship learning activities that strengthen students' digital marketing skills and support their interest and confidence in starting a business.

Research Objectives

This study developed three objectives, which are:

1. To examine how attitude towards entrepreneurship, subjective norms, and perceived behavioural control relate to entrepreneurial intention among polytechnic students.
2. To examine digital marketing literacy relates to students' entrepreneurial intention, attitudes towards entrepreneurship, subjective norms, and perceived behavioural control.
3. To examine the attitude towards entrepreneurship, subjective norms and perceived behavioural control help explain the relationship between digital marketing literacy and entrepreneurial intention.

Literature Review

This section reviews previous research on digital marketing literacy and entrepreneurial intention through the Theory of Planned Behaviour (TPB). The discussion is organised into four themes: TPB and entrepreneurial intention, digital marketing literacy and digital competence, psychological pathways, and the polytechnic and Technical and Vocational Education and Training (TVET) context. The review compares findings across studies, considers differences in the concepts measured, and identifies areas that require further investigation. Eight hypotheses are developed from the reviewed evidence.

Theory of Planned Behaviour and Entrepreneurial Intention

The Theory of Planned Behaviour (TPB) provides a basis for understanding how students develop entrepreneurial intention. It is based on three elements: attitude toward entrepreneurship, subjective norms and perceived behavioural control. These are students' perspectives on entrepreneurship, the perceptions of the people they know and their perceptions of their own entrepreneurial skills. The relevance of these factors is generally well supported by previous research, but relationships with entrepreneurial intention are inconsistent across educational settings (Al-Jubari, 2019; Teoh et al., 2024; Low et al., 2026).

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From the reviewed studies, attitude towards entrepreneurship seems to be the important factor. However, the evidence for subjective norms and perceived behavioural control is less consistent. Among Malaysian business undergraduates, attitude and perceived behavioural control were significant predictors of entrepreneurial intention, while subjective norms were not (Teoh et al., 2024). However, the investigation with Malaysian polytechnic and community college students revealed that there was a significant relationship between attitude and subjective norms, while perceived behavioural control was not significant (Siran et al., 2025). Another study of Malaysian private university students showed that all three TPB components were significantly linked to entrepreneurial intention towards digital entrepreneurship (Low et al., 2026). Combined, these results confirm the applicability of TPB and indicate that the importance of the TPB factors may vary among groups of students.

Variations in results should also be considered about the measurement of each study. Entrepreneurial intention, digital entrepreneurial intention and entrepreneurial readiness intentions are distinct outcomes that are related. A student who feels ready to explore entrepreneurship may not necessarily intend to establish a business. Similarly, an intention to start a digital business may involve different considerations from general entrepreneurial intention. Differences in student backgrounds and the measures used may therefore help explain why the findings vary (Teoh et al., 2024; Siran et al., 2025; Low et al., 2026).

Studies extending TPB also suggest that entrepreneurial intention may be related to factors beyond the three original constructs. Research combining TPB with self-determination theory found that attitude towards entrepreneurship and perceived behavioural control played significant mediating roles, while mediation through subjective norms was not supported (Al-Jubari, 2019). An extended TPB study involving creativity, innovativeness, and social media use also identified significant relationships involving attitude towards change and other factors (Ngamkanokwan, 2023). However, attitude towards change is not the same as attitude towards entrepreneurship. These findings show the value of extending TPB, but they also highlight the need to distinguish clearly between psychological constructs.

Overall, the reviewed evidence suggests that attitude, subjective norms, and perceived behavioural control remain relevant to entrepreneurial intention. Yet their relationships require further examination among polytechnic students, particularly because findings from other educational settings cannot be assumed to apply equally to this group. The following hypotheses are derived from the TPB, and studies reviewed.

H1: Polytechnic students' attitude towards entrepreneurship has a positive relationship with entrepreneurial intention.
H2: Subjective norms have a positive relationship with entrepreneurial intention of the polytechnic students.
H3: Perceived behavioural control is positive related to entrepreneurial intention for Polytechnic students.

Digital Marketing Literacy and Entrepreneurial Intention

Digital marketing literacy is the knowledge and skills needed to comprehend and execute marketing activities with digital means. These activities are promotion on the internet, communication with customers and using digital platforms to target potential customers. Digital marketing literacy is similar to digital literacy but is not the same. Digital marketing

and general digital literacy are both types of digital literacy, but the first is more specific to digital marketing activities. This distinction is important as the previous studies have employed different digital constructs in their entrepreneurial intention studies (Ahmad et al., 2022; Fawaid et al., 2022; Suryani & Chaniago, 2023).

The link between digital marketing literacy and entrepreneurial intention is still unclear. The Malaysian students' evidence revealed that there is a positive correlation between students' digital marketing literacy and their intentions to become digital entrepreneurs. Yet, Digital marketing literacy lost its significance when other variables were added to the regression model, and personal attitude remained significant (Ahmad et al., 2022). Meanwhile, studies on vocational students in Indonesia indicated that there was a significant relationship between digital marketing and entrepreneurial intention, while self-efficacy also contributed to entrepreneurial intention, and entrepreneurial personality also contributed to entrepreneurial intention (Fawaid et al., 2022). This indicates that digital marketing can have an impact on entrepreneurial intention. However, this impact may vary based on the psychological and educational aspects included in the model.

There is evidence that supports this from research on more general digital competencies, though it does not go so far as to fully answer this question. There is a positive relationship between entrepreneurial intention with digital literacy among students of polytechnic in Indonesia (Suryani & Chaniago, 2023). Likewise, there was a significant relationship between digital literacy and the entrepreneurial interest with digital marketing as found by Nasrullah et al., 2024. Additionally, TPB and TAM resulted in a relationship between entrepreneurial intentions and the adoption of digital marketing tools (Dung et al., 2023). All these studies collectively suggest that there may be a relationship between digital knowledge and techno-related activities and entrepreneurial development. However, the term digital literacy, the adoption of technology, entrepreneurial interest and entrepreneurial intention are distinct constructs. Their results, therefore, cannot be used as direct evidence of the same relationship. The mixed results also indicate that the digital knowledge is not enough to explain entrepreneurial intention. Students might know how to market products online but not necessarily have a goal of creating a business. They also may be influenced by their attitudes towards entrepreneurship as something to aspire to and their self-efficacy in running a business. This interpretation is like the research that shows that in addition to digital skills, the attitudes

and psychological beliefs of students towards entrepreneurship play an important role as a foundation for entrepreneurial growth in digital economy (Ahmad et al., 2022; Sutiadiningsih et al., 2025; Awang et al., 2026). Two other relationships are thus worthy of consideration. Firstly, students who have higher digital marketing literacy may perceive a better attitude towards entrepreneurship, knowing that digital tools can assist the business. Secondly, it was found that digital marketing knowledge level was positively related to perceived behavioural control, especially in situations where students perceive their ability to control the tasks of digital marketing. While the reviewed studies offer a foundation for the expectations, the relationship between digital marketing literacy, attitude towards entrepreneurship and perceived behavioural control has not been determined (Al-Jubari, 2019; Sutiadiningsih et al., 2025; Awang et al., 2026).

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Digital marketing literacy is, therefore, explored in the present study as a separate factor in TPB framework. It considers both its direct relationship with entrepreneurial intention and its relationships with attitude towards entrepreneurship and perceived behavioural control. The following hypotheses are proposed:

H4: Digital marketing literacy is positively related to entrepreneurial intention among polytechnic students.

H5: Digital marketing literacy is positively related to attitude towards entrepreneurship among polytechnic students.

H6: Digital marketing literacy is positively related to perceived behavioural control among polytechnic students.

H7: Digital marketing literacy is positively related subjective norms among polytechnic students.

The Psychological Linkages between Digital Learning and Entrepreneurial Intention

The link between digital competences and the entrepreneurial intention could not only be of technical nature. Students with similar digital skills may have different perspective on entrepreneurship or their self-evaluation of business start-up skills. The differences have been explored in the previous studies in the context of attitude (Awang et al., 2026; Sutiadiningsih et al., 2025; Al-Jubari, 2019), self-efficacy, entrepreneurial mindset, and creativity.

Based on the evidence from vocational and higher education studies, there is the possibility of indirect relationships that could explain why the relationship between digital competencies and entrepreneurial intention is not always direct. A study conducted among vocational students in Indonesia revealed that there was no direct link between digital competence and entrepreneurial intention, but there were indirect links between digital competence and entrepreneurial intention through entrepreneurial mindset and self-efficacy (Sutiadiningsih et al., 2025). Likewise, another study conducted in Malaysia found that the relationship between digital entrepreneurship education and digital entrepreneurial intention is mediated by entrepreneurial attitude and self-efficacy (Awang et al., 2026). These results indicate that attitudes towards

entrepreneurship and entrepreneurial self-efficacy of students have a potential to explain the relationship between digital learning and entrepreneurial intention. But the two studies looked at different digital factors. Digital competence is related to skills; digital entrepreneurship education is related to learning experiences. Their results should thus be considered as evidence of a relationship, but not necessarily a single common relationship.

More research in relation to digital marketing education also supports the role of the psychological. Digital marketing-based entrepreneurship learning was significantly related to entrepreneurial intention and self-efficacy (Sunaryo et al., 2025). Another study revealed that there is a mediation on the relationship between entrepreneurship education, communication skills, and entrepreneurial intention through digital marketing (Suryandari et al., 2025). These results indicate that digital marketing may play a role in students' entrepreneurial development but varies by research model. Specifically, assessing digital marketing in the context of an educational process is not assessing digital marketing literacy of students.

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Other studies have considered different psychological pathways. Creativity was found to mediate the relationship between practice-oriented entrepreneurship education and digital entrepreneurial intention, while digital literacy moderated the relationship between education and intention (Liang et al., 2025). This means that digital marketing education is also shown to be relevant in students' innovation and entrepreneurial intention in a systematic literature review (Husnah et al., 2024). These studies in combination reveal that entrepreneurial intention could be linked with some psychological and educational variables. But mediation and moderation are relationships of different types, and the results should not be construed as proof of the fact that all the digital competencies are mediated by the same psychological process.

Attitude towards entrepreneurship and perceived behavioural control are important factors for the present study because they are components of TPB. Attitude is the state of mind of students towards entrepreneurship (positive or negative). Perceived behavioural control concerns whether they believe they can carry out entrepreneurial activities, considering their abilities and perceived barriers. This is unlike entrepreneurial self-efficacy which is more specific to confidence in engaging in entrepreneurial activities. Although previous studies have reported significant indirect relationships involving attitude, self-efficacy, and perceived behavioural control, these constructs should not be treated as interchangeable (Al-Jubari, 2019; Sutiadiningsih et al., 2025; Awang et al., 2026).

These findings provide a basis for examining two possible indirect relationships. Digital marketing literacy may be associated with a more positive attitude towards entrepreneurship when students recognise how online marketing can support a business. It may also be associated with stronger perceived behavioural control when students believe digital marketing tasks are within their abilities. These attitudes and beliefs may, in turn, be related to entrepreneurial intention.

However, the reviewed studies do not directly establish these mediating relationships for digital marketing literacy. Most examined broader digital skills, learning experiences, or different psychological factors. The present study therefore tests whether attitude towards entrepreneurship and perceived behavioural control help explain the relationship between digital marketing literacy and entrepreneurial intention. The following hypotheses are proposed:

H8: Attitude towards entrepreneurship mediates the relationship between digital marketing literacy and entrepreneurial intention among polytechnic students.

H9: Perceived behavioural control mediates the relationship between digital marketing literacy and entrepreneurial intention among polytechnic students.

H10: Subjective norms control mediates the relationship between digital marketing literacy and entrepreneurial intention among polytechnic students

Polytechnic and TVET Context: Research Gaps and Theoretical Contribution

The educational context is an important consideration when examining entrepreneurial intention. University, polytechnic, and vocational students may have different learning experiences and career expectations. As a result, relationships identified among university students may not necessarily apply to students in technical and vocational education. Previous

Malaysian research has examined entrepreneurial intention through personality, social support, TPB factors, and digital learning, but the student groups and outcomes studied have varied (Ismail et al., 2009; Ahmad et al., 2022; Teoh et al., 2024; Siran et al., 2025; Low et al., 2026). Earlier research among Malaysian undergraduates identified relationships involving personality characteristics and social support (Ismail et al., 2009). More recent studies have focused on TPB factors and digital entrepreneurship. Although these studies provide useful evidence, their findings cannot be directly compared without considering differences in the student populations and the meanings of their dependent variables (Teoh et al., 2024; Siran et al., 2025; Low et al., 2026). Entrepreneurial readiness intentions and digital entrepreneurial intentions should not automatically be treated as equivalent to general entrepreneurial intention.

Studies involving vocational students provide a closer basis for the present research. Digital marketing has been linked to entrepreneurial intention and related psychological factors among Indonesian vocational students (Fawaid et al., 2022). Positive relationships have also been reported between digital literacy and entrepreneurial intention among polytechnic students (Suryani & Chaniago, 2023). Research in digital competence, however, shows that there is not a significant direct relationship, but significant indirect relationships with entrepreneurial intention (Sutiadiningsih et al., 2025). Digital marketing studies in the context of entrepreneurship education have also explored various connections between communication skills and entrepreneurial intention (Suryandari et al., 2025). When combined these results indicate that digital skills have a role to play in research into vocational entrepreneurship, but the extent of the role is contingent on the definition and measurement of digital competence and entrepreneurial outcomes.

Another issue arises in the context of the Malaysian polytechnic. The study conducted in Johor among Polytechnic and Community College students revealed that there are significant relationships between attitude and subjective norms, but there is no significant relationship between perceived behavioural control and intention (Siran et al., 2025). This is opposed to findings among Malaysian business undergraduates whereby attitude and perceived behavioural control were important (Teoh et al., 2024). Similarly, the study of private university students revealed significant relationships between all three TPB factors and Digital entrepreneurial intention (Low et al., 2026). Based on these differences, we can conclude that more studies are required before any conclusion regarding the relative importance of TPB factors among polytechnic students can be drawn.

Based on the literature review, three research gaps are identified. The first has to do with the relationship between digital marketing literacy and entrepreneurial intentions, which is inconsistent. Some studies show that there are significant relationships regarding to digital marketing, but others indicate that when taking other predictors into account, digital marketing literacy loses its significance (Ahmad et al., 2022; Fawaid et al., 2022). This brings up the question of whether digital marketing literacy adds to the entrepreneurial intention over the original TPB factors.

The second gap relates to the psychological mechanisms that could exist between digital marketing literacy and entrepreneurial intention. Previous studies have focused on attitude, self-efficacy, entrepreneurial mindset, and creativity in various models (Al-Jubari, 2019; Liang et al., 2025; Sutiadiningsih et al., 2025; Awang et al., 2026). But a lot of this evidence is about general, digital competence, digital entrepreneurship education or about digital activities in

general. Little is known about the relationship between marketing specific digital literacy and entrepreneurial intention via attitude towards entrepreneurship and perceived behavioural control.

The third gap is related to the educational context and assessment of entrepreneurial outcomes. Several studies with Malaysian University, Polytechnic, and Community College students have reported varying results, whether it is entrepreneurial intention, digital entrepreneurial intention, or entrepreneurial readiness intentions (Teoh et al., 2024; Siran et al., 2025; Low et al., 2026). These differences make it hard to compare directly and thus warrant the studies that provide a clear definition of entrepreneurial intention in a polytechnic context.

The present study aims to fill in these gaps by introducing an extended TPB model which incorporates digital marketing literacy, attitude towards entrepreneurship, subjective norms, and perceived behavioural control. It explores if digital marketing literacy has a direct relationship with entrepreneurial intention and if attitude and perceived behavioural control are intervening variables. Digital marketing literacy is not supposed to have a significant direct/indirect relationship. Rather, it examines these relationships through a model that separates the digital marketing knowledge and students' attitudes, social influences, perceived control, and entrepreneurial intention.

The benefit of this study is that the factors will be studied together amongst polytechnic in Malaysia. This study can shed light on the question of whether digital marketing literacy offers additional understanding on entrepreneurial intention by comparing the original TPB relationship with the proposed extended model. It may also help explain why students with similar digital marketing knowledge differ in their intentions to start a business.

Conceptual Framework

Based on the literature review, this study proposes a conceptual framework that combines digital marketing literacy with the Theory of Planned Behaviour (TPB). The framework includes attitude towards entrepreneurship, subjective norms, and perceived behavioural control as factors related to entrepreneurial intention. Digital marketing literacy is added to examine its direct relationship with entrepreneurial intention and its relationships with attitude and perceived behavioural control. The framework also examines whether attitude and perceived behavioural control mediate the relationship between digital marketing literacy and entrepreneurial intention. These relationships are represented by eight hypotheses (H1–H8), as shown in Figure 1.

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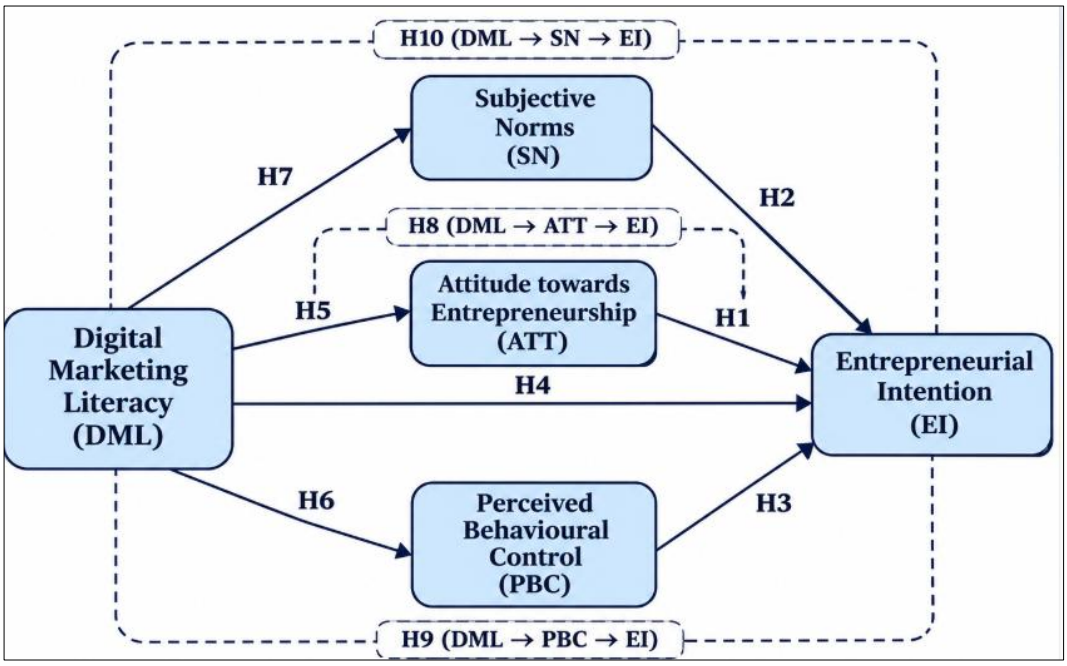

Figure 1: Proposed Conceptual Framework

Source: Developed by the researcher based on the Theory Planned Behaviour (TPB)

Research Methodology

This study used a quantitative approach to examine the relationship between digital marketing literacy and entrepreneurial intention among Polytechnic Hulu Terengganu students. A cross-sectional survey was conducted using an online questionnaire. The study involved 156 students from four diploma programmes: Tourism Management (DUP), Recreation Management (DRT), Resort Management (DHR), and Accounting (DAC).

The research data was gathered by a structured questionnaire consisting of five broad variables: Digital Marketing literacy, attitude towards entrepreneurship, subjective norms, perceived behavioural control, and entrepreneurial intention. The questionnaire initially had 50 items. There are 30 items adapted from Moorthy and Sahid (2022) which are going to be used to measure the digital marketing literacy. The items span over three dimensions: Knowledge of digital marketing literacy, digital participation related to entrepreneurial information, and knowledge of digital marketing elements. There are 10 questions for every dimension. The TPB items will be taken from Al-Jubari (2019) who utilized 5 items for attitude towards entrepreneurship, 3 items for subjective norms, 6 items for perceived behavioural control and 6 items for entrepreneurial intention. Another original source to measure entrepreneurial intention will be Linan and Chen (2009). Thus, the planned questionnaire will have 50 measurement items. Basic information on the respondents will be collected in a separate section.

Students' responses will be captured using a five-point Likert scale from strongly disagree to strongly agree. The questionnaire will be disseminated using an online survey. The purpose of the study will be explained to the students prior to answering. It will be voluntary, and all responses will remain confidential and only for research purposes.

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The data were analysed by descriptive statistics to describe the respondents and to summarise their answers. Validity and reliability tests will be conducted to see the quality of the questionnaire. Partial least squares structural equation modelling (PLS-SEM) is proposed to test the ten hypotheses. The analysis will examine the direct relationships between the variables (H1–H7) and the mediating roles of attitude, subjective norms and perceived behavioural control (H8–H10). Bootstrapping will be used to test the indirect relationships. The original TPB model also will not be matched with the extended model to see if digital marketing literacy contributes to explaining entrepreneurial intention.

Results

Respondents' Profile

The data obtained from the respondents who study from four programmes at Polytechnic Hulu Terengganu. Respondents for this study is 156 respondents. The gender distribution was nearly equal with 79 (50.6%) male students and 77 (49.4%) female students. Most of the respondents were Malay (86.5%), Indian (6.4%), Chinese (4.5%) and other ethnic groups (2.6%). There were 50 students (32.1%) from Tourism Management (DUP), 38 students (24.4%) from Resort Management (DHR), 34 students (21.8%) from Accounting (DAC) and 34 students (21.8%) from Recreation Management (DRT) were in the field of study. When discussing of entrepreneurship experience, 95 students (60.9%) indicated that they had entrepreneurship experience and 61 students (39.1%) indicated that they did not have entrepreneurship experience. The same percentages were found with respect to the involvement of the family in entrepreneurship. All 156 respondents (100%) said they use Instagram, TikTok and WhatsApp for digital platform usage. 85 students (54.5%) said they used websites and 10 (6.4%) said they used Telegram. In general, the respondents belonged to various academic programmes with a relatively similar gender split. Most of them were already experienced entrepreneurs and had family exposure to entrepreneurship, and the platforms most referenced were Instagram, TikTok and WhatsApp.

Assessment of the Measurement Model

This study used a two-step approach to analyse the data using PLS-SEM. Before testing the hypotheses, the measurement model (i.e., outer model) was assessed. This evaluation analysed the question items according to their measurement of the constructs. It also ensured the reliability and the appropriateness of the items used in the study (Churchill, 1979). Content, convergent, and discriminant validity were used to evaluate the measurement model as recommended by Hair et al. (2014). These tests were used to assess the consistency of the items in measuring their constructs, and the separateness of the constructs. Figure 2 shows the measurement model used in this study. After assessing the measurement model, the analysis moved to the structural model to test the proposed hypotheses.

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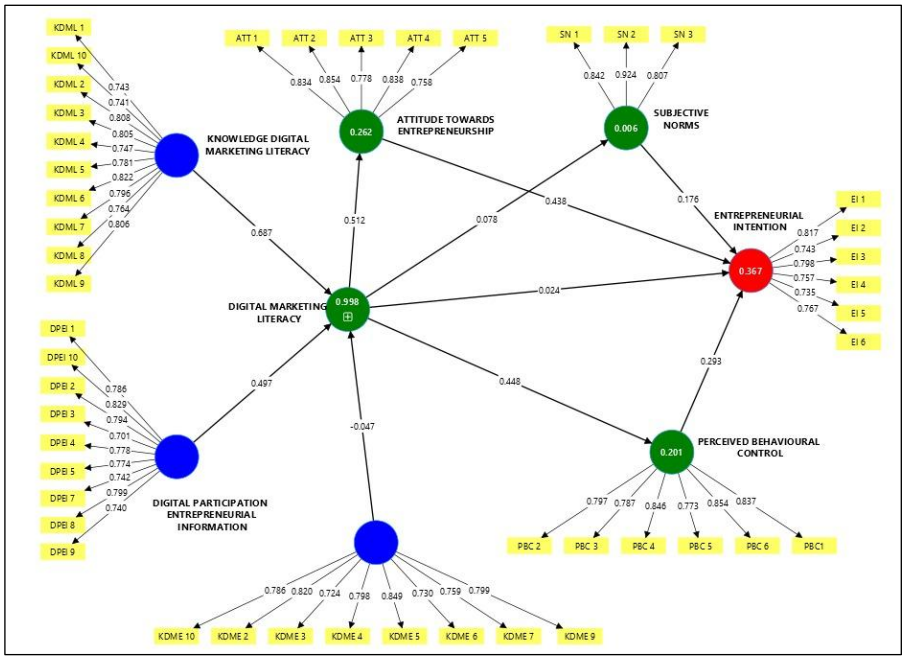

Figure 2: Measurement Model

Convergent Validity

Convergent validity evaluates how well indicators of the same construct correlate. It is assessed using factor loadings, average variance extracted (AVE), and composite reliability (CR) in reflective measurement models (Sekaran & Bougie, 2016). Fornell and Larcker (1981) and Hair et al. (2014) state that the loadings which are more than 0.50 are acceptable, but the items which are less than 0.40 need to be removed. If loadings between 0.40 and 0.70 increase CR or AVE, they might be kept. Furthermore, the CR must be greater than 0.70 and the AVE must be greater than 0.50. Table 1 below presents the reliability and convergent validity results for the four constructs. The factor loadings ranged from 0.735 to 0.924. Cronbach's alpha values ranged from 0.827 to 0.900, while composite reliability values ranged from 0.867 to 0.927 for rho_and 0.894 to 0.923 for rho_c. All values were above the recommended level of 0.70, showing that the items were consistent in measuring their constructs. The AVE values ranged from 0.593 to 0.738, Overall, the results show that the four constructs met the recommended levels for reliability and convergent validity.

Table 1: Convergent Validity for First Order Construct (Reflective and Formative)

First Order	Items	Loading	Cronbach' alpha	CR (rho_a)	CR (rho_c)	AVE
Attitude towards Entrepreneurship	ATT1	0.834	0.872	0.875	0.907	0.662
	ATT2	0.854				
	ATT3	0.778				
	ATT4	0.838				
	ATT5	0.758				

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Subjective Norms	SN1	0.842	0.827	0.927	0.894	0.738
	SN2	0.924				
	SN3	0.806				
Perceived Behavioural Control	PBC1	0.837	0.900	0.909	0.923	0.666
	PBC2	0.797				
	PBC3	0.787				
	PBC4	0.846				
	PBC5	0.773				
	PBC6	0.854				
Entrepreneurial Intention	EI1	0.817	0.863	0.867	0.897	0.593
	EI2	0.743				
	EI3	0.798				
	EI4	0.757				
	EI5	0.735				
	EI6	0.767				

Digital marketing literacy was measured using a Type II reflective–formative higher-order model. The model has three dimensions: knowledge of digital marketing literacy, digital participation in entrepreneurial information, and knowledge of digital marketing elements. These three dimensions were measured separately at the first stage and then combined to form the overall digital marketing literacy construct at the second stage. The study used a disjoint two-stage approach to analyse the model. In the first stage, outer loadings, composite reliability, and AVE were used to check the reliability and validity of the three dimensions.

Thus, the convergent validity for the second order construct is determine separately and the results is presented in Table 2 below. For the second-order construct's reflective measurement model assessment for convergent validity, reliability and convergent validity of digital marketing literacy dimensions is show by Table 2 above. It shows that that the outer loadings ranged from 0.701 to 0.849. All retained items were above the recommended value of 0.70, suggesting that they measured their respective dimensions well. The Cronbach's alpha values were between 0.910 to 0.929 while composite reliability values ranged from 0.917 to 0.930 for rho_a and 0.927 to 0.940 for rho_c. The AVE values obtained were between 0.597 to 0.615, which satisfy the minimum value of 0.50 recommended. This shows evidence of convergent validity between the three dimensions. Three items, DPEI6, KDME1 and KDME8, were deleted due to low outer loadings. After removing these items, there were 27 items in a final measurement model.

Table 2: Convergent Validity for Second Order Construct (Reflective)

Second Order	**Items**	**Loading**	**Cronbach' alpha**	**CR (rho_a)**	**CR (rho_c)**	**AVE**
Knowledge of Digital Marketing Literacy	KDML 1	0.743	0.929	0.930	0.940	0.611
	KDML 2	0.808				

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	KDML 3	0.805				
	KDML 4	0.747				
	KDML 5	0.781				
	KDML 6	0.822				
	KDML 7	0.796				
	KDML 8	0.764				
	KDML 9	0.806				
	KDML 10	0.741				
Digital Participation in Entrepreneurial Information	DPEI 1	0.786	0.915	0.917	0.930	0.597
	DPEI 2	0.794				
	DPEI 3	0.701				
	DPEI 4	0.778				
	DPEI 5	0.774				
	DPEI 7	0.732				
	DPEI 8	0.799				
	DPEI 9	0.740				
	DPEI 10	0.829				
Knowledge of Digital Marketing Elements	KDME 2	0.820	0.910	0.918	0.927	0.615
	KDME 3	0.724				
	KDME 4	0.798				
	KDME 5	0.849				
	KDME 6	0.730				
	KDME 7	0.759				
	KDME 9	0.799				
	KDME 10	0.786				

Notes: DPEI 6, KDME 1 and KDME 8 were deleted due to low loading.

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From the overall results, the three dimensions can be considered to have good reliability and convergent validity. The objects that are retained seem to be of uniform size in each dimension. Yet, the discriminant validity must be tested to ensure that the three dimensions are measuring different aspects of digital marketing literacy.

Discriminant Validity

Discriminant validity looks at how different each construct is from the other. It helps show that each construct measures its own concept (Hair et al., 2017; Sarstedt et al., 2014). This study used the Heterotrait-Monotrait Ratio (HTMT) to assess discriminant validity. Following Henseler et al. (2015), HTMT values should be below 0.90. As shown in Table 3, the HTMT values ranged from 0.052 to 0.561. All values were below the recommended threshold of 0.90. This shows that the seven first-order reflective constructs are sufficiently different. Therefore, discriminant validity was established for the reflective constructs in this study.

Table 3: Discriminant Validity HTMT Ratio

	ATT	DPEI	EI	KDME	KDML	PBC	SN
ATT							
DPEI	0.423						
EI	0.561	0.348					
KDME	0.335	0.489	0.277				
KDML	0.538	0.521	0.405	0.544			
PBC	0.149	0.452	0.396	0.216	0.390		
SN	0.068	0.113	0.229	0.052	0.085	0.085	

Assessment Of the Structural Model

According to Chin (1998), after the study has established the appropriateness of the measure, then the evidence that support the theoretical model can be accomplished. In PLS-SEM, the structural model is also known as an inner model. The structural model describes the relationship between the latent variables that were hypothesized in the research model. Figure 3 below depicted the structural model of this study.

Before proceeds to the structural model assessment, the lateral collinearity test needs to be conducted to make sure that there are no collinearity issues in the model. This is because, in the computation of the path coefficients to examine the relationship of the constructs, it rests on a series of regression analysis. So, the regression results must not be biased by this collinearity issues. Collinearity issues were assessed as proposed by Hair et al. (2017) by looking at the variance inflation factor (VIF) values. The VIF value must be lower than the threshold value of 3.3 (Diamantopoulos and Siguaw, 2006) indicating that collinearity is not a major concern of this study.

As shown in Table 4, all the inner VIF values for all the independent variables in the model which are attitude, subjective norms, perceived behavioural control and digital marketing literacy are less than 3.3. Specifically, the inner VIF values range from 1.009 to 1.706, which means that collinearity is not a major problem in this study.

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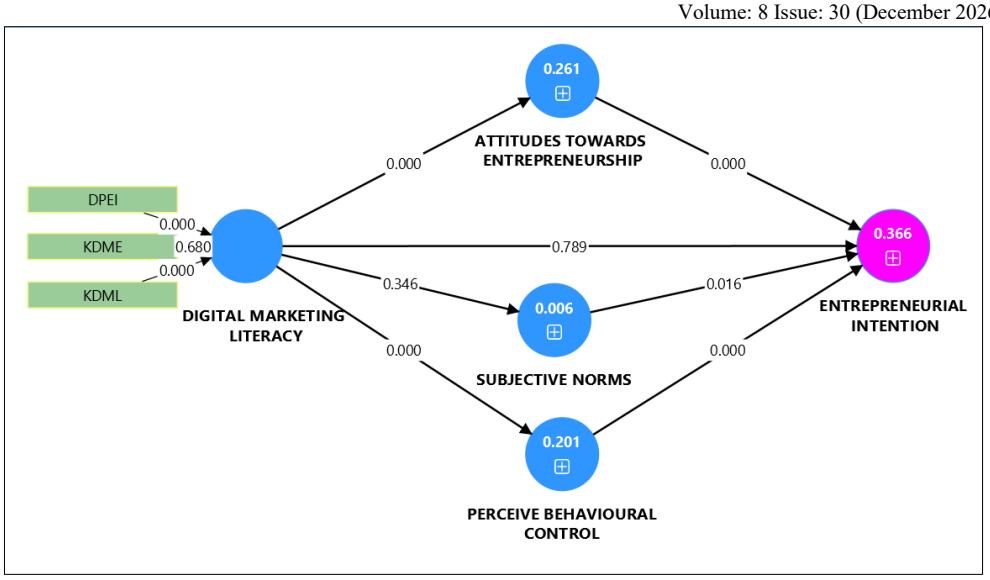

Figure 3: Structural Model

Table 4: Results of Lateral Collinearity Assessment

Variables	Inner VIF Value Entrepreneurial Intention
Attitude	1.378
Subjective Norm	1.009
Perceived Behavioral Control	1.276
Digital Marketing Literacy	1.706

Hypotheses Testing and Discussion

The path coefficient represents the hypothesized relationships that link the construct. It helps the researcher to determine the strength of the relationship of the constructs. In general, path coefficient values are standardized on a range from -1 to +1. When coefficients are closer to +1, indicates a strong positive relationship, meanwhile when coefficients are closer to -1, indicates a strong negative relationship.

Previously, to determine the hypothesis whether it is supported or not is based on the direction of the beta value and the significance level of the t-value (Hair et al. 2013). The value of the beta must be aligned with the direction of the hypothesis generated and the t-value must be higher than 1.645. However, with the new guidelines by Hair et al. (2017), hypothesis is supported not only based on the direction of the beta value and the significance level of the t-value, but researcher must also examine the p-value that must be lower than 0.05 and the confidence intervals of lower level (LL) and upper level (UL) which does not straddle a zero in between. For assessing the structural model, a bootstrapping procedure as suggested by Chin (1998) was done with 5000 subsamples were taken from the original sample with replacement, which in turn computed the approximate t-values for the hypotheses testing. Thus, the direct effects of all 10 hypotheses are tabulated in Table 5 below with a bootstrapping procedure. Table 5 presents the results of hypothesis testing using PLS-SEM bootstrapping. Of the ten hypotheses tested, seven were supported, while three were not supported. The findings are

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discussed alongside previous research to understand how digital marketing literacy and the Theory of Planned Behaviour (TPB) factors relate to entrepreneurial intention among polytechnic students.

Table 5: Hypothesis Testing for the Direct Effect and Mediating Effect

	Hypothesis	Beta (*B*)	*t* Values	*p* Values	Confidence Interval		Decision
					LL	UL	
H1	ATT -> EI	0.437	6.166	0.000	0.289	0.568	Supported
H2	SN -> EI	0.180	2.226	0.026	-0.039	0.308	Unsupported
H3	PBC -> EI	0.293	3.700	0.000	0.117	0.424	Supported
H4	DML -> EI	0.404	5.593	0.000	0.238	0.514	Supported
H5	DML -> ATT	0.517	8.103	0.000	0.360	0.613	Supported
H6	DML -> PBC	0.453	8.194	0.000	0.328	0.544	Supported
H7	DML -> SN	0.083	0.791	0.429	-0.178	0.230	Unsupported
H8	DML -> ATT -> EI	0.226	4.746	0.000	0.141	0.328	Supported
H9	DML -> PBC -> EI	0.133	3.365	0.001	0.059	0.215	Supported
H10	DML -> SN -> EI	0.015	0.720	0.471	-0.023	0.019	Unsupported

Note. One-tailed test. $p < 0.05$*. Factors

Attitude towards Entrepreneurship and Entrepreneurial Intention (H1)

Attitude towards entrepreneurship showed a significant positive relationship with entrepreneurial intention ($\beta = 0.437$, $p < 0.001$), supporting H1. This suggests that students who see entrepreneurship as an attractive career are more likely to consider starting their own businesses. This finding aligns with prior research which found that attitude is a determinant of entrepreneurial intention (Al-Jubari, 2019; Teoh et al., 2024; Low et al., 2026). A significant relationship between attitude and entrepreneurial readiness intentions has also been found among Polytechnic and Community College students in Johor by Siran et al. (2025). Although their study measured readiness intentions rather than entrepreneurial intention directly, the findings suggest that students' personal views play an important role in how they approach entrepreneurship.

Subjective Norms and Entrepreneurial Intention (H2)

Subjective norms did not show a significant relationship with entrepreneurial intention ($\beta = 0.180$, $p = 0.026$). Therefore, H2 was not supported. This suggests that students' intentions to start a business were not strongly related to the expectations or approval of family, friends, and other important people once the other factors were considered. A similar finding was reported by Teoh et al. (2024), who found that subjective norms were not a significant predictor of

entrepreneurial intention among Malaysian business undergraduates. However, Siran et al. (2025) found a significant relationship between subjective norms and entrepreneurial readiness intentions, while Low et al. (2026) reported a significant relationship with digital entrepreneurial intention. These differences suggest that social expectations may not have the same influence across student groups and educational settings.

Perceived Behavioural Control and Entrepreneurial Intention (H3)

Perceived behavioural control had a significant positive relationship with entrepreneurial intention ($\beta = 0.293$, $p < 0.000$), supporting H3. Students who believe they can manage business activities tend to show stronger intentions to become entrepreneurs. This result is consistent with Al-Jubari (2019) and Teoh et al. (2024) which found perceived behavioural control as one of the key factors that predict entrepreneurial intention. Similarly, Low et al. (2026) also reported a significant correlation with digital entrepreneurial intention. But the results of Siran et al. (2025) showed that perceived behavioural control did not significantly predict entrepreneurial readiness intentions. This discrepancy could be due to the students' self-perceptions of their own competence, and the varying outcomes being assessed in each study.

Digital Marketing Literacy and Entrepreneurial Intention (H4)

Digital marketing literacy positively and significantly related with entrepreneurial intention ($\beta = 0.404$, $p < 0.000$), supporting H4. This indicates that greater digital marketing knowledge and skills are positively correlated with greater intentions to start a business. The result is in line with Fawaid et al. (2022) which states that there is a significant relationship between digital marketing and entrepreneurial intention of vocational students in Indonesia. These types of results are like those found by Suryani and Chaniago (2023) who investigated general digital literacy and entrepreneurial intention and by Nasrullah et al. (2024) who investigated digital marketing, digital literacy and entrepreneurial interest.

However, the results contradict a similar study by Ahmad et al. (2022) which noted that after the inclusion of other variables, digital marketing literacy did not have a significant impact on digital entrepreneurial intention. The results of Sutiadiningsih et al. (2025) also revealed that there was no direct influence of digital competence on entrepreneurial intention for the vocational students. The various results indicate that the connection might be related to the kind of digital competencies examined, as well as the psychological traits incorporated into the model.

Digital Marketing Literacy, Attitude, and Perceived Behavioural Control (H5 and H6)

Digital marketing literacy was positively and significantly associated with attitude towards entrepreneurship ($\beta = 0.517$ $p < 0.000$) and perceived behavioural control ($\beta = 0.453$, $p < 0.001$). Therefore, H5 and H6 were supported. These findings suggest that students who understand digital marketing may view entrepreneurship more positively and feel more capable of managing business activities.

The results are consistent with related research on digital learning and entrepreneurial beliefs. Awang et al. (2026) found that digital entrepreneurship education was positively related to entrepreneurial attitude and self-efficacy among Malaysian higher education students. Fawaid et al. (2022) also reported a significant relationship between digital marketing and

entrepreneurial self-efficacy. Similarly, Sunaryo et al. (2025) examined how digital marketing-based entrepreneurship learning related to students' self-confidence and entrepreneurial intention.

Although these studies examined digital education, digital marketing, and self-efficacy rather than the exact relationships tested here, they provide support for the role of digital knowledge in shaping students' entrepreneurial views and beliefs about their abilities. The present findings suggest that digital marketing literacy is relevant not only to students' business knowledge but also to how they evaluate entrepreneurship.

Digital Marketing Literacy and Subjective Norms (H7)

Digital marketing literacy did not show a significant relationship with subjective norms ($\beta = -0.083$, $p = 0.429$). Thus, H7 was not supported. This suggests that students' digital marketing knowledge was not significantly related to how they perceived the expectations of people around them.

Previous studies have shown mixed findings concerning subjective norms. While Teoh et al. (2024) found no significant relationship between subjective norms and entrepreneurial intention, Siran et al. (2025) and Low et al. (2026) reported significant relationships with entrepreneurial readiness intentions and digital entrepreneurial intentions, respectively. However, these studies did not directly test the relationship between digital marketing literacy

and subjective norms. The present result therefore offers a different perspective. Having digital marketing skills may be related to students' personal attitudes and perceived abilities without being strongly associated with the social expectations they experience.

Mediating Role of Attitude towards Entrepreneurship (H8)

Attitude towards entrepreneurship showed a significant indirect relationship between digital marketing literacy and entrepreneurial intention ($\beta = 0.226$, $p < 0.000$), supporting H8. This suggests that students with stronger digital marketing literacy may also view entrepreneurship more positively, and these positive views are associated with stronger entrepreneurial intentions.

The finding is consistent with Awang et al. (2026), who found that entrepreneurial attitude mediated the relationship between digital entrepreneurship education and digital entrepreneurial intention. Al-Jubari (2019) also found that attitude is an important variable between the variables of psychological needs satisfaction and entrepreneurial intention. While the starting factors of these studies differ, they all point to the importance of attitude in understanding entrepreneurial intentions of students.

Mediating Role of Perceived Behavioural Control (H9)

Perceived behavioural control also revealed that there is a significant indirect relationship between digital marketing literacy and entrepreneurial intention ($\beta = 0.133$, $p = 0.001$), thus supporting H9. This implies that digital marketing knowledge could be related to entrepreneurial intention partly because of the self-efficacy beliefs of students to do business.

The finding is consistent with Al-Jubari (2019), who identified a significant mediating role for perceived behavioural control. Related evidence was reported by Sutiadiningsih et al. (2025), who found that entrepreneurial self-efficacy and entrepreneurial mindset mediated the relationship between digital competence and entrepreneurial intention. Awang et al. (2026) also discovered an indirect significant relationship through entrepreneurial self-efficacy. While self-efficacy and perceived behavioural control are not the same constructs, the results of these studies indicate that the beliefs about one's capabilities can contribute to the understanding of the relationship between the digital skills and entrepreneurial intention.

Mediating Role of Subjective Norms (H10)

Subjective norms did not significantly mediate the relationship between digital marketing literacy and entrepreneurial intention ($\beta = 0.015$, $p = 0.471$). Therefore, H10 was not supported. This suggests that perceived social expectations did not provide a significant pathway linking digital marketing literacy with entrepreneurial intention.

A similar pattern was reported by Al-Jubari (2019), who found that subjective norms did not significantly mediate the relationship between psychological needs satisfaction and entrepreneurial intention. Although the independent variables differed, both studies suggest that subjective norms may play a weaker mediating role than other psychological factors. In the present study, attitude and perceived behavioural control provided significant indirect relationships, while subjective norms did not.

Overall Discussion

Overall, the findings show that digital marketing literacy is positively related to entrepreneurial intention, both directly and through attitude towards entrepreneurship and perceived behavioural control. This aligns with the studies indicating the importance of digital skills and psychological factors in relation to students' entrepreneurial intentions (Fawaid et al., 2022; Sutiadiningsih et al., 2025; Awang et al., 2026).

Results further indicate that attitude is more directly related to entrepreneurial intention than perceived behavioural control and that subjective norms do not play a significant role in the model estimated. This is in line with the notion that when it comes to entrepreneurship as a future career, students' own assessments and perceptions of their capabilities are especially important.

The results indicate that the digital marketing knowledge gained by the students of polytechnics might be useful as well as positive attitudes and confidence in managing a business. But don't assume that the relationships represent cause and effect. The results indicate the associations found in the study and serve as a foundation to comprehend entrepreneurial intention in the extended TPB context.

Conclusion

This study focused on the correlation between digital marketing literacy and entrepreneurial intention of Polytechnic students based on the Theory of Planned Behaviour (TPB). Results indicated that there was a positive relationship between digital marketing literacy and entrepreneurial intention. The students who had more knowledge on digital marketing were

also in general more positive on entrepreneurship and were also more confident on their ability to manage business activities. Attitude towards entrepreneurship and perceived behavioural control were both significantly related to entrepreneurial intention. They also contributed in elucidating the association between digital marketing literacy and entrepreneurial intention. But subjective norms was not significantly related. These results indicate that pupils' own attitude and belief in their own capabilities might be more important than the expectations of those around them. The findings underline the importance of integrating digital marketing capabilities with hands-on entrepreneurship experiences for polytechnic teachers, fostering confidence and a better understanding of entrepreneurial opportunities among students.

There are some limitations to this study. The case study was conducted on 156 Polytechnic Hulu Terengganu students. The results do not necessarily reflect the views of students from other polytechnics and/or educational institutions in Malaysia. Purposive sampling was also used, and this type of sampling has the disadvantage of not providing enough coverage of the study. widely the results can be applied. Second, data was obtained at one time period using a questionnaire. This implies that the results reveal a correlation between the variables, however, cannot determine that digital marketing literacy is the sole cause for entrepreneurial intention. The students have also indicated their own Knowledge, Attitude and Intentions, which may not necessarily correspond to their skills or actual behaviour. Entrepreneurship intention was studied not whether students had started or successfully managed a business.

Future study might be conducted by students of other Polytechnics and programmes from other states to widen the understanding of entrepreneurial intention of TVET students. It would be helpful to have a study that tracks students over time. It can study if knowledge of DM and entrepreneurial intention ultimately convert into actual business actions. Future researchers may investigate other factors including entrepreneurial self-efficacy, family business experience, financial support and also practical entrepreneurship training. These can contribute to students being prepared to start a business or not. A review of student use of digital marketing in the real-world of business, particularly in relation to social media, online selling and engaging with customers would also be beneficial. It could help polytechnics to design learning experiences that not only equip students with an understanding of entrepreneurship but also enable them to make their first steps towards entrepreneurship.

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Declaration on the Use of Artificial Intelligence (AI) "The authors declare that generative AI or AI-assisted technologies were used during the preparation of this manuscript. The following tools were used: ChatGPT, Consensus AI, Mendeley and Grammarly. The tools were used for language editing, grammar improvement, translation, data analysis, or other purposes. All AI-assisted content was reviewed and verified by the authors, who take full responsibility for the accuracy, originality, integrity, and final content of the manuscript."

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