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THE IMPACT OF DIGITAL LITERACY ON DIGITAL ENTREPRENEURIAL INTENTION AMONG VIETNAMESE UNIVERSITY STUDENTS: THE SERIAL MEDIATING ROLES OF SELFEFFICACY AND PERCEIVED DESIRABILITY

Mac Xuan Dung[1*], Dang Xuan Cuong[2]

[1]*Ho Chi Minh City University of Industry and Trade; PhD candidate at Lac Hong University*

[2]*Ho Chi Minh City University of Industry and Trade*

[*]Email: *dungmx@huit.edu.vn*

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ABSTRACT

This study sets out to explore how digital literacy shapes entrepreneurial intentions among Vietnamese university students, drawing on data from 618 participants across 13 institutions. Using a combination of PLS-SEM and fsQCA, the research not only tests direct, mediated, and moderated effects but also uncovers multiple pathways leading to high entrepreneurial intention. The findings indicate that digital literacy, encompassing AI literacy, digital skills, and Fintech knowledge significantly predicts entrepreneurial intention, with self-efficacy and perceived desirability acting as serial mediators in this relationship. Interestingly, having a family business background appears to strengthen the link between digital literacy and intention, while the model accounts for over half of the variance in entrepreneurial intention (54.8%). The fsQCA results further reveal that three distinct, equally effective configurations: technology-driven, passion-driven, and balanced can all lead to strong intentions. Conceptually, this work extends both the Entrepreneurial Event Model (EEM) and Social Cognitive Career Theory (SCCT) by positioning digital literacy as a key antecedent and empirically testing serial mediation in the context of digital entrepreneurship. On a practical level, the findings suggest that universities should weave digital competencies throughout their curricula, while policymakers might consider supporting entrepreneurship education that is fully integrated with digital tools and consider the facilitating role of family business background when designing interventions.

Keywords: Digital entrepreneurial intention, digital literacy, self-efficacy, perceived desirability, PLS-SEM, fsQCA, Vietnam.

1. INTRODUCTION

Vietnam has experienced rapid digital transformation in recent years. Internet penetration exceeds 73%, and the digital economy is projected to reach $50 billion by 2025 [1]. The government actively promotes digital entrepreneurship among youth through its National Digital Transformation Program [2]. Yet despite these favorable conditions, most university students do not pursue digital entrepreneurship. One survey found that while 85% of students use digital technologies daily, only 4.7% engage in entrepreneurial activities [3].

Existing research offers limited answers. Most studies using the Entrepreneurial Event Model or Theory of Planned Behavior were conducted in pre-digital contexts. It is unclear whether these frameworks apply when entrepreneurship is technology driven. Recent work on AI literacy [4], Fintech knowledge [5], and digital skills [6] has focused on direct effects, not

underlying mechanisms. However, prior studies rely on linear analytical approaches, which may overlook the configurational nature of entrepreneurial phenomena, where different combinations of factors can lead to similar outcomes [7].

To address this limitation, the present study pursues three main objectives. First, we test whether self-efficacy and perceived desirability serially mediate the relationship between digital literacy and DEI. Second, we examine whether family business background moderates this relationship. Third, we use fsQCA to identify configurational pathways to high DEI.

We hope this study contributes to theory by extending EEM and SCCT to digital entrepreneurship and by testing serial mediation. And contributes to practice by identifying specific mechanisms that universities and policymakers can target to foster digital entrepreneurship.

2. THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical foundations

2.1.1. Entrepreneurial Event Model (EEM)

According to Shapero and Sokol [8], the Entrepreneurial Event Model (EEM) suggests that the drive to start a business is rooted in two fundamental perceptions: perceived desirability and perceived feasibility. The former captures how attractive the prospect of entrepreneurship feels to an individual, while the latter centers on their self-belief in managing the practical complexities of a new venture. Beyond these, the model introduces the "propensity to act," a dispositional trigger that bridges the gap between thinking about a business and launching one.

While the EEM has earned broad validation in traditional sectors [9,10], its application to the digital landscape offers a unique perspective. In this context, desirability often hinges on the appeal of technology-enabled business models, whereas feasibility is increasingly tied to an individual's mastery of digital platforms and technological tools [1].

2.1.2. Social Cognitive Career Theory (SCCT)

Drawing on the work of Lent, Brown, and Hackett [11], Social Cognitive Career Theory (SCCT) highlights the dynamic interplay between cognitive variables such as self-efficacy and outcome expectations and the environmental factors that shape career development. According to SCCT, an individual's belief in their own capabilities does not exist in a vacuum; it directly fuels their expectations of success, which together crystallize into specific career interests and intentions.

What makes this theory particularly relevant for digital entrepreneurship is its focus on learning experiences as the primary engine for self-efficacy [3,12]. This suggests that educational interventions are not just about transferring knowledge; they are transformative experiences that build the "digital confidence" necessary to turn abstract potential into concrete entrepreneurial action.

2.1.3. Integration of EEM and SCCT in digital contexts

By integrating EEM and SCCT, this study establishes a more robust framework for deciphering how digital entrepreneurial intentions are formed. The strength of this synthesis lies in its complementary nature: while EEM identifies the fundamental perceptual drivers, desirability, and feasibility, SCCT provides the "missing link" by clarifying the cognitive processes, such as self-efficacy and outcome expectations, that connect raw competencies to these perceptions.

This integrated perspective moves away from the simplistic assumption that digital literacy directly triggers intention. Instead, it recognizes a more nuanced reality: digital skills must first be internalized as domain-specific confidence and a genuine attraction to the digital landscape before they can effectively translate into entrepreneurial drive [2,13].

2.2. Digital literacy in entrepreneurship

Digital literacy extends beyond basic technological proficiency to encompass multidimensional competencies that enable individuals to effectively navigate digital environments for entrepreneurial purposes. Building on recent scholarship, digital literacy in this study is conceptualized as comprising three key dimensions.

AI literacy refers to the capability to understand, apply, evaluate, and ethically utilize artificial intelligence technologies [4,14,15]. Beyond technical proficiency, AI literacy encompasses the ability to understand, apply, evaluate, and ethically utilize artificial intelligence technologies [16], which is increasingly important as AI applications such as customer service chatbots and predictive analytics become more prevalent in business operations.

Fintech literacy denotes knowledge and understanding of financial technologies, including blockchain systems, crowdfunding platforms, digital payment solutions, and robot-advisory services [5,17,18]. Fintech literacy has been recognized as a key factor in promoting financial inclusion and enabling entrepreneurs to leverage digital financial services for business development [19].

Digital skills represent proficiency in the use of digital tools for communication, collaboration, content creation, problem-solving, and opportunity recognition [6,20,21]. These foundational competencies support the effective implementation of digital entrepreneurship activities.

2.3. Hypothesis development

2.3.1. Digital literacy and self-efficacy

Students who possess stronger digital skills are more confident in using technology for complex tasks [22]. In this study, digital literacy includes AI literacy, Fintech knowledge, and practical digital skills. We expect that students who master these competencies will feel more capable of starting and running a digital business, because they have already succeeded in related technology tasks (e.g., using AI tools, managing digital payments). Previous studies in entrepreneurship have shown similar patterns: digital skills predict entrepreneurial self-efficacy [12,13]. Therefore:

H1: Digital literacy is positively associated with digital entrepreneurial self-efficacy.

2.3.2. Digital literacy and perceived desirability

Perceived desirability refers to how attractive entrepreneurship appears to an individual [8]. When students understand digital tools and platforms, entrepreneurship may seem more feasible and less intimidating, making it a more appealing career option. For example, a student who knows how to set up an online store or use digital marketing tools may view entrepreneurship as a realistic and desirable path rather than a risky or unfamiliar one. Prior research supports this logic [1,6]. Thus:

H2: Digital literacy positively influences perceived desirability toward digital entrepreneurship.

2.3.3. Self-efficacy and perceived desirability

People tend to like activities they believe they are good at [22]. Applied to entrepreneurship, students who are confident in their entrepreneurial abilities such as

identifying opportunities, developing products, or managing an online business should find entrepreneurship more attractive. Meta-analytic evidence confirms that self-efficacy is a consistent predictor of entrepreneurial desirability [10]. In the digital context, this relationship is even stronger because technology lowers many traditional barriers to entry. Hence:

H3: Digital entrepreneurial self-efficacy positively influences perceived desirability toward digital entrepreneurship.

2.3.4. Self-efficacy and digital entrepreneurial intention

There is convincing evidence across many countries that self-efficacy directly predicts entrepreneurial intentions [23,24]. Confident individuals set higher goals, persist longer, and recover more quickly from setbacks. In digital entrepreneurship, self-efficacy includes confidence in using technology to find opportunities, build products, and manage online operations. Students who believe they can handle these challenges should have stronger intentions to pursue digital entrepreneurship. Therefore:

H4: Digital entrepreneurial self-efficacy positively predicts digital entrepreneurial intention.

2.3.5. Perceived desirability and digital entrepreneurial intention

According to the Entrepreneurial Event Model [8], perceived desirability how attractive entrepreneurship seems to an individual directly influences entrepreneurial intention. A large body of research supports this relationship [9,10]. In the digital context, desirability may be even more important because digital business models offer flexibility, lower startup costs, and the possibility of rapid scaling. Students who find these features attractive are more likely to form strong intentions. Hence:

H5: Perceived desirability positively predicts digital entrepreneurial intention.

2.3.6. Serial mediating effects of Self-Efficacy and Perceived Desirability

We expect that digital literacy affects entrepreneurial intention through a sequential process, not just a single step. First, digital literacy builds self-efficacy (H1). Second, higher self-efficacy makes entrepreneurship seem more attractive. Third, greater attractiveness strengthens intentions (H5). This chain literacy → confidence → desirability → intention is consistent with Social Cognitive Career Theory [11], which argues that learning experiences (here, digital literacy) shape self-efficacy, which then influences outcome expectations (desirability) and intentions. Recent studies in digital entrepreneurship have found similar mediation patterns [4,25]. Thus:

H6: Digital entrepreneurial self-efficacy and perceived desirability serially mediate the relationship between digital literacy and digital entrepreneurial intention.

2.3.7. Moderating role of family business background

Family business background is a well-known contextual factor in entrepreneurship research [26,27]. Students whose families own businesses have access to role models, firsthand observation, and sometimes financial resources. This background may help them translate digital literacy into entrepreneurial intentions more effectively. For example, a student with a family business can experiment with digital tools in a real-world setting and receive guidance from experienced entrepreneurs. Several recent studies in Vietnam and other emerging economies have found that family support amplifies the effects of digital skills on entrepreneurial intentions [5,28]. Therefore:

H7: Family business background positively moderates the relationship between digital literacy and digital entrepreneurial intention.

2.3.8. Configurational pathways to digital entrepreneurial intention

Entrepreneurial intentions rarely result from a single factor alone. Different combinations of conditions such as high digital literacy with low desirability, or strong family background with moderate self-efficacy may still lead to the same outcome (high intention). This idea, called equifinality, has been applied in entrepreneurship research using fsQCA [7,29]. We expect to find multiple pathways, including (a) technology-driven (high literacy + high self-efficacy), (b) passion-driven (high desirability + family background), and (c) balanced (moderate levels across all factors). Thus:

H8: Multiple equifinal configurations of digital literacy, self-efficacy, perceived desirability, and family business background lead to high digital entrepreneurial intention.

2.4. Research model

Drawing on the integrated EEM-SCCT framework, we propose the conceptual model (see Figure 1), which depicts the hypothesized relationships among digital literacy, digital entrepreneurial self-efficacy, perceived desirability, family business background, and digital entrepreneurial intention.

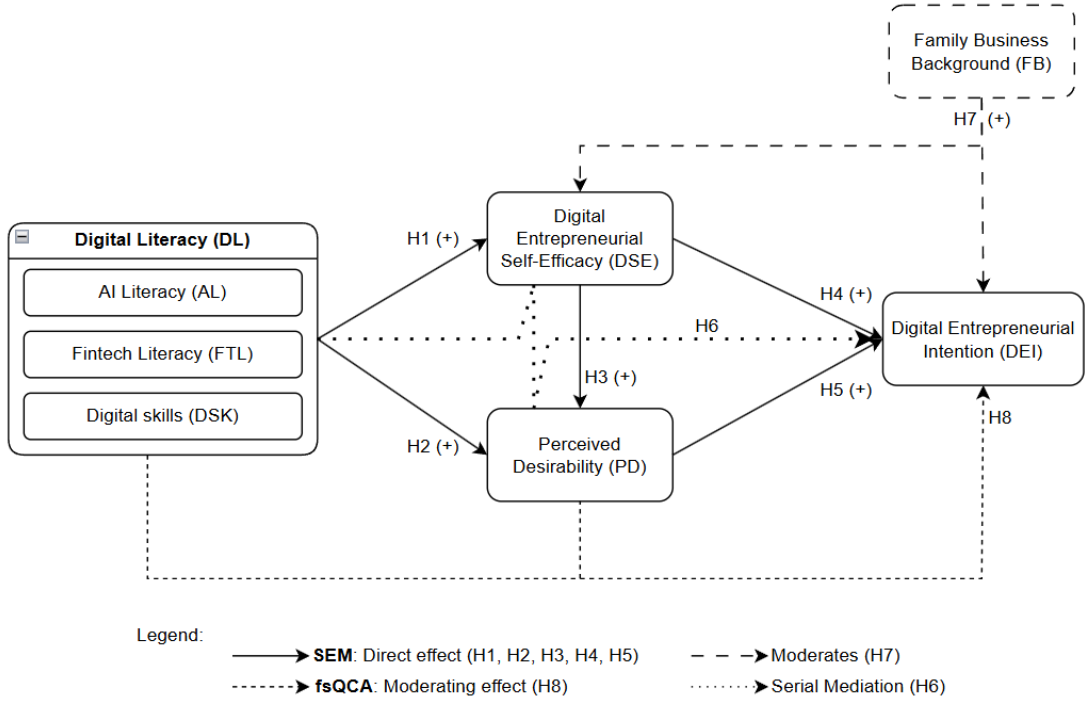

Figure 1. Proposed conceptual model (Source: Compiled by the author)

3. RESEARCH METHODS

3.1. Research design and sample

This study adopted a quantitative, cross-sectional design. Data were collected through structured questionnaires administered online (via Google Forms) and in person across universities in Vietnam from August to December 2025. A stratified random sampling approach was employed to ensure representation across geographical regions (Northern, Central, and Southern Vietnam) and university types (public and private).

Sample Characteristics. The final sample comprised 618 usable responses (corresponding to a response rate of 87.3%) from 13 universities, including 9 public and 4 private institutions. Table 1 summarizes the detailed demographic characteristics of the sample.

Table 1. Sample demographic characteristics (N = 618)

Characteristic	Category	Frequency	Percentage
Gender	Male	312	50.5%
	Female	299	48.4%
	Other/Prefer not to say	7	1.1%
Year of Study	Second year	124	20.1%
	Third year	246	39.8%
	Fourth year	218	35.3%
	Fifth year and above	30	4.8%
Major	Business/Economics	284	46.0%
	Engineering/Technology	198	32.0%
	Social Sciences	76	12.3%
	Natural Sciences	42	6.8%
	Other	18	2.9%
Region	Northern Vietnam	202	32.7%
	Central Vietnam	184	29.8%
	Southern Vietnam	232	37.5%
Family Business Background	Yes	286	46.3%
	No	332	53.7%

Note: Percentages may not sum to 100 due to rounding.

3.2. Measurement instruments

All constructs were measured using multi-item scales adapted from previously validated studies to ensure content validity, with reliability assessed in subsequent analyses. Items were rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire was initially developed in English and then translated into Vietnamese using Brislin's [30] back-translation procedure to ensure linguistic and conceptual equivalence. Two bilingual researchers with expertise in entrepreneurship independently reviewed the translated version to ensure accuracy and contextual appropriateness.

A pilot study was conducted with 45 university students from diverse academic backgrounds to assess the clarity, comprehensibility, and relevance of the measurement items. Based on pilot feedback, minor wording adjustments were made to enhance clarity and ensure alignment with the Vietnamese educational context.

In line with the proposed theoretical framework, digital literacy was conceptualized as a multidimensional construct and modeled as a second-order reflective-reflective construct, comprising three key dimensions: AI literacy, Fintech literacy, and digital skills. These dimensions collectively reflect students' overall digital literacy in the entrepreneurial context. This higher-order specification enables the examination of the holistic influence of digital

literacy on the mediating variables and the outcome variable while retaining the distinct effects of each dimension. Table 2 summarizes the measurement scales, items, and sources for all constructs included in the study.

Table 2. Measurement Scales, Items, and Sources

Construct	Item	Measurement	Source
Digital Literacy (Second-Order construct)			
AI Literacy (AIL)	AIL1	I understand basic concepts of artificial intelligence	[4, 14]
	AIL2	I can effectively use AI-powered applications in daily tasks	
	AIL3	I can critically evaluate AI-generated content and recommendations	
	AIL4	I understand ethical considerations in AI use	
Fintech Literacy (FTL)	FTL1	I understand how blockchain technology works	[5, 17]
	FTL2	I am familiar with crowdfunding platforms for business funding	
	FTL3	I understand how digital payment systems operate	
	FTL4	I can evaluate different Fintech solutions for business needs	
Digital Skills (DSK)	DSK1	I can effectively use digital tools for communication and collaboration	[6, 20]
	DSK2	I can create digital content for business purposes	
	DSK3	I can solve technical problems using digital resources	
	DSK4	I can identify business opportunities using digital platforms	
Digital Entrepreneurial Self-Efficacy (DESE)	DESE1	I am confident in my ability to identify digital business opportunities	[4, 23, 31]
	DESE2	I am confident in my ability to develop digital products and services	
	DESE3	I am confident in my ability to market products using digital channels	
	DESE4	I am confident in my ability to manage an online business successfully	
Perceived Desirability (PD)	PD1	Starting a digital business is extremely attractive to me	[1, 9]
	PD2	I would enjoy being a digital entrepreneur	
	PD3	A digital entrepreneurial career offers many benefits	
	PD4	I would find great satisfaction in running my own online business	
Digital Entrepreneurial Intention (DEI)	DEI1	I am determined to start a digital business in the future	[1, 3,4]
	DEI2	I have seriously considered becoming a digital entrepreneur	
	DEI3	I am willing to make significant efforts to become a digital entrepreneur	
	DEI4	My professional goal is to become a digital entrepreneur	
Family Business Background (FB)	FB	My family members own or operate a business (coded as 1 = Yes, 0 = No)	[5, 27]

Note: All items were measured using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree), unless otherwise specified.

Digital literacy is a second-order reflective-reflective construct, with AI literacy, Fintech literacy, and Digital skills as its three dimensions. The second-order construct was formed and used in structural model analysis (see Section 4.3).

3.3. Data analysis using PLS-SEM and fsQCA

Data analysis was conducted in four stages.

Stage 1: Preliminary analysis was performed using IBM SPSS Statistics 27.0 to compute descriptive statistics, assess common method bias (Harman's single-factor test), and conduct correlation analyses.

Stage 2: Measurement model assessment was conducted using SmartPLS 3.0 [32]. The following criteria were evaluated: (a) internal consistency reliability (Cronbach's α, composite reliability (CR)); (b) convergent validity (average variance extracted (AVE ≥ 0.50)); (c) discriminant validity (Heterotrait-Monotrait ratio (HTMT ≤ 0.85)); and (d) model fit (SRMR ≤ 0.08), as a supplementary index.

Stage 3: Structural model assessment and hypothesis testing were performed using PLS-SEM with 5,000 bootstrap resamples. The analysis examined: (a) path coefficients (β) and their significance (t-values, p-values); (b) explanatory power (R^2); (c) predictive relevance (Stone-Geisser Q^2); (d) mediation effects using bootstrapped confidence intervals; and (e) moderation effects using the product indicator approach in PLS-SEM.

Stage 4: Configurational analysis was conducted using fsQCA 3.0 to identify causal pathways leading to high DEI [33,34]. Conditions were calibrated using the direct method with three anchors: 10% (full non-membership), 50% (crossover point), and 90% (full membership).

4. RESULTS

4.1. Common method variance assessment

Given the cross-sectional and self-reported nature of the data, we conducted several diagnostic tests to assess the potential influence of common method variance (CMV). Following Podsakoff et al. [35], both Harman's single-factor test and the full collinearity test were employed.

First, Harman's single-factor test was conducted by entering all measurement items into an unrotated exploratory factor analysis. The results showed that the first factor explained 32.4% of the total variance, which is below the commonly used threshold of 50%, suggesting that CMV is unlikely to be a major concern.

Second, following Kock's [36] guidelines, variance inflation factors (VIF) were examined using the full collinearity test. All VIF values ranged from 1.218 to 3.742, which are below both the conservative threshold of 5 and the more stringent threshold of 3.3. VIF values exceeding these thresholds would indicate potential common method bias.

Collectively, these results suggest that CMV is unlikely to pose a serious threat to the validity of the findings.

4.2. Measurement model assessment

All indicator loadings exceeded the recommended threshold of 0.70, and Cronbach's α and composite reliability (CR) values exceeded 0.70. In addition, average variance extracted (AVE) values were above 0.50 [37]. These results indicate adequate reliability and convergent validity. Table 3 reports the detailed measurement of model results.

Table 3. Measurement model assessment results (N = 618)

Construct	Item	Outer loading	Cronbach's α	CR	AVE
AI Literacy (AIL)	AIL1	0.852	0.892	0.925	0.755
	AIL2	0.889			
	AIL3	0.876			
	AIL4	0.858			
Fintech Literacy (FTL)	FTL1	0.847	0.884	0.920	0.742
	FTL2	0.881			
	FTL3	0.862			
	FTL4	0.854			
Digital Skills (DSK)	DSK1	0.861	0.890	0.924	0.752
	DSK2	0.878			
	DSK3	0.869			
	DSK4	0.859			
Digital Entrepreneurial Self-Efficacy (DESE)	DESE1	0.873	0.901	0.931	0.770
	DESE2	0.886			
	DESE3	0.879			
	DESE4	0.867			
Perceived Desirability (PD)	PD1	0.882	0.896	0.928	0.763
	PD2	0.876			
	PD3	0.867			
	PD4	0.870			
Digital Entrepreneurial Intention (DEI)	DEI1	0.891	0.909	0.936	0.785
	DEI2	0.888			
	DEI3	0.885			
	DEI4	0.879			

Note: Cronbach's α = internal consistency reliability; CR = composite reliability; AVE = average variance extracted.

To assess discriminant validity, the Heterotrait-Monotrait ratio (HTMT) was employed. As shown in Table 4, all HTMT values were below the conservative threshold of 0.85, supporting discriminant validity among the constructs [38].

Table 4. Discriminant validity assessment (HTMT Ratio)

Construct	AIL	FTL	DSK	DESE	PD	DEI
AI Literacy (AIL)	—					
Fintech Literacy (FTL)	0.782	—				
Digital Skills (DSK)	0.761	0.793	—			
Digital Entrepreneurial Self-Efficacy (DESE)	0.732	0.744	0.768	—		
Perceived Desirability (PD)	0.641	0.658	0.682	0.724	—	
Digital Entrepreneurial Intention (DEI)	0.593	0.611	0.627	0.682	0.745	—

Note: All HTMT values are below the conservative threshold of 0.85, supporting discriminant validity among the constructs.

4.3. Second-order construct assessment

Following Hair et al. [37] guidelines for higher-order construct modeling, digital literacy was specified as a reflective-reflective second-order construct comprising three first-order dimensions: AI literacy, Fintech literacy, and digital skills. This specification enables the examination of the holistic influence of digital literacy on the mediating variables and the outcome variable while retaining the distinct contributions of each dimension.

The second-order construct was assessed by examining the significance and magnitude of the outer loadings from digital literacy to its dimensions, as well as its reliability and convergent validity. The results indicate that all three dimensions loaded significantly on the second-order construct: AI literacy (loading = 0.362, $p < 0.001$), Fintech literacy (loading = 0.358, $p < 0.001$), and digital skills (loading = 0.374, $p < 0.001$).

The second-order construct exhibited strong internal consistency, with composite reliability (CR = 0.912), and adequate convergent validity, with average variance extracted (AVE = 0.682). These results suggest that the three dimensions collectively reflect students' overall digital literacy in the entrepreneurial context.

4.4. Structural model assessment

The structural model was evaluated using PLS-SEM with 5,000 bootstrap resamples, following established guidelines [37]. The assessment focused on path coefficients (β), statistical significance, explanatory power (R^2), predictive relevance (Q^2), as well as mediation and moderation effects.

4.4.1. Direct effects

The hypothesized direct relationships (H1-H5) were tested, and the results are presented in Table 5. All hypothesized paths were positive and statistically significant ($p<0.001$), supporting H1 through H5.

Table 5. Direct effects (Hypothesis Testing Results)

Hypothesis	Path	β	t-value	p-value	95% CI	Decision
H1	DL → DESE	0.482	12.456	< 0.001	[0.408, 0.556]	Supported
H2	DL → PD	0.342	8.234	< 0.001	[0.263, 0.421]	Supported
H3	DESE → PD	0.418	10.876	< 0.001	[0.345, 0.491]	Supported
H4	DESE → DEI	0.294	6.782	< 0.001	[0.212, 0.376]	Supported
H5	PD → DEI	0.367	8.945	< 0.001	[0.289, 0.445]	Supported

Note: β=standardized path coefficient; DL = Digital Literacy; DESE = Digital Entrepreneurial Self-Efficacy; PD = Perceived Desirability; DEI = Digital Entrepreneurial Intention; CI = bias-corrected confidence interval is based on bias-corrected bootstrapping (5,000 resamples)

Specifically, digital literacy had a strong positive effect on digital entrepreneurial self-efficacy (β = 0.482, $p<0.001$) and a moderate positive effect on perceived desirability (β = 0.342, $p<0.001$). In addition, digital entrepreneurial self-efficacy significantly influenced perceived desirability (β = 0.418, $p<0.001$) and digital entrepreneurial intention (β=0.294, $p<0.001$). Perceived desirability also exerted a significant positive effect on digital entrepreneurial intention (β = 0.367, $p<0.001$).

These findings provide empirical support for the proposed theoretical relationships and confirm the relevance of both cognitive (self-efficacy) and motivational (perceived desirability) mechanisms in explaining digital entrepreneurial intention.

4.4.2. Mediation effects

Hypothesis 6 proposed that digital entrepreneurial self-efficacy (DESE) and perceived desirability (PD) serially mediate the relationship between digital literacy (DL) and digital entrepreneurial intention (DEI).

The mediation analysis results are reported in Table 6. Bootstrapping results with bias-corrected 95% confidence intervals indicate that all indirect effects are statistically significant ($p<0.001$), as none of the confidence intervals include zero.

Table 6. Indirect effects and bootstrap confidence intervals (5,000 resample)

Path	Indirect effect (β)	SE	p-value	95% CI
DL → DESE → DEI	0.137	0.031	< 0.001	[0.076, 0.198]
DL → PD → DEI	0.119	0.027	< 0.001	[0.068, 0.173]
DL → DESE → PD → DEI	0.069	0.019	< 0.001	[0.033, 0.108]
Total indirect	0.325	0.045	< 0.001	[0.237, 0.415]

Note: Mediation is supported if the CI does not contain zero.

The mediation results (Table 6) show three significant indirect pathways from digital literacy to digital entrepreneurial intention. First, the path through self-efficacy alone (DL → DESE → DEI) is significant ($\beta=0.137$, $p<0.01$), meaning that digital literacy partly influences intention by building students' confidence. Second, the path through perceived desirability alone (DL → PD → DEI) is also significant ($\beta=0.119$, $p<0.01$), suggesting that digital literacy also works by making entrepreneurship seem more attractive. Third, and most importantly, the serial pathway (DL → DESE → PD → DEI) is significant ($\beta=0.069$, $p<0.01$). This supports our proposed sequential mechanism: digital literacy first increases self-efficacy, higher self-efficacy then increases perceived desirability, and greater desirability finally strengthens entrepreneurial intention. The total indirect effect ($\beta=0.325$, $p<0.001$) confirms that mediation plays a substantial role in explaining how digital literacy relates to DEI. Taken together, these findings support H6.

4.4.3. Moderation effect

Hypothesis 7 posited that family business background (FB) moderates the relationship between digital literacy and digital entrepreneurial intention.

The moderation analysis was conducted using the product indicator approach in PLS-SEM. As shown in Table 7, the interaction term (DL × FB) was positive and statistically significant ($\beta=0.186$, $p<0.001$), supporting H7.

Table 7. Moderation effect results (H7)

Hypothesis	path	β	t-value	p-value	95% CI	Decision
H7	DL × FB → DEI	0.186	4.234	< 0.001	[0.102, 0.270]	Supported

This result suggests that the positive effect of digital literacy on digital entrepreneurial intention is stronger for students with a family business background, highlighting the role of contextual and experiential factors in shaping entrepreneurial outcomes.

4.4.4. Explanatory power and Predictive relevance

The explanatory power of the model was assessed using R^2 values. As presented in Table 8, the R^2 values ranged from 0.523 to 0.548, indicating moderate explanatory power across all endogenous constructs [37].

Specifically, digital literacy explained 52.3% of the variance in digital entrepreneurial self-efficacy, while the combined effects of digital literacy and self-efficacy explained 54.7% of the variance in perceived desirability. Furthermore, digital entrepreneurial intention was explained at 54.8% by its antecedents.

Predictive relevance was evaluated using the Stone-Geisser Q^2 values obtained through the blindfolding procedure. All Q^2 values were positive and greater than zero, indicating that the model has adequate predictive relevance for all endogenous constructs.

Table 8. Explanatory power and Predictive relevance

Endogenous construct	R^2	Adjusted R^2	Q^2 (Stone-Geisser)
Digital Entrepreneurial Self-Efficacy (DESE)	0.523	0.518	0.498
Perceived Desirability (PD)	0.547	0.541	0.522
Digital Entrepreneurial Intention (DEI)	0.548	0.542	0.521

Note: R^2 = coefficient of determination; Adjusted R^2 = adjusted coefficient of determination; Q^2 = Stone-Geisser predictive relevance (obtained via blindfolding procedure); R^2 values of 0.25, 0.50, and 0.75 indicate weak, moderate, and substantial explanatory power, respectively [37]; Q^2 values greater than zero indicate predictive relevance

4.5. Model fit indices

Following Henseler et al. [38], model fit was assessed as a supplementary criterion using the standardized root mean square residual (SRMR) and the normed fit index (NFI). The SRMR value of 0.062 is below the recommended threshold of 0.08, indicating an acceptable level of fit. In addition, the NFI value of 0.912 exceeds the commonly suggested threshold of 0.90.

Taken together, these indices suggest that the model demonstrates an acceptable level of fit, although model evaluation in PLS-SEM primarily emphasizes predictive and explanatory capabilities.

4.6. Configurational Analysis Results (fsQCA)

Hypothesis 8 posited that multiple configurational paths involving digital literacy (DL), digital entrepreneurial self-efficacy (DESE), perceived desirability (PD), and family business background (FB) lead to high digital entrepreneurial intention (DEI). The fsQCA results, presented in Table 9, identify three distinct configurations (tech-savvy, passionate, and balanced) that collectively achieve an overall solution consistency and coverage, supporting the equifinality proposition of H8.

Table 9. Configurational pathways to high digital entrepreneurial intention (fsQCA)

Consistency	Configuration	Conditions	Raw coverage
Tech-savvy	High DL + High DESE	0.41	0.91
Passion-driven	High PD + Present FB	0.37	0.89
Balanced	High DL + High DESE + High PD	0.44	0.92

Solution summary: Overall consistency = 0.88, Overall coverage = 0.64

Note: DL = Digital Literacy; DESE = Digital Entrepreneurial Self-Efficacy; PD = Perceived Desirability; FB = Family Business Background. Consistency threshold = 0.80. Only configurations with raw coverage > 0.10 are reported.

The fsQCA results (Table 9) reveal three configurations associated with high digital entrepreneurial intention, supporting the idea of equifinality (H8).

Configuration 1 (Tech-savvy). High digital literacy combined with high self-efficacy is sufficient for high DEI, regardless of desirability or family background. This suggests that for some students, competence and confidence alone can drive entrepreneurial intentions.

Configuration 2 (Passion-driven). High perceived desirability together with family business background leads to high DEI, even when digital literacy and self-efficacy are low. This pathway highlights the role of affective motivation and contextual exposure.

Configuration 3 (Balanced). Important levels of all three psychological factors digital literacy, self-efficacy, and desirability jointly produce high DEI. This represents a comprehensive pathway where cognitive and motivational conditions align.

The overall solution consistency of 0.88 exceeds the recommended threshold of 0.80, indicating that these configurations are reliable. The coverage of 0.64 suggests that the three pathways account for a substantial portion of high DEI cases.

Taken together, these findings confirm that multiple equifinal pathways lead to digital entrepreneurial intention, complementing the net-effect findings from PLS-SEM.

5. DISCUSSION AND IMPLICATIONS

5.1. Theoretical contributions

This research builds upon the Entrepreneurial Event Model (EEM) and Social Cognitive Career Theory (SCCT), adapting them to the digital age by exploring how digital literacy (DL) shapes entrepreneurial intent through specific psychological lenses. Rather than viewing these as direct links, the findings reveal a nuanced serial mediation pathway (DL → DESE → PD → DEI). This suggests a sequential cognitive-affective journey: as individuals master digital competencies, their self-confidence grows, which subsequently makes the prospect of entrepreneurship more attractive, eventually crystallizing into a firm intention. By moving beyond simple direct-effect models, this study offers a more integrated look at how digital readiness fuels motivation.

Beyond these pathways, the study contributes to the growing body of literature on technology-enabled entrepreneurship. While existing research often emphasizes the technical side like AI literacy or Fintech knowledge, we still know little about the "why" behind their impact. Our evidence shows that these competencies do not exist in a vacuum; they operate primarily through psychological mechanisms, reinforcing the idea that cognitive and motivational factors remain central even in high-tech entrepreneurial settings.

Context also plays a pivotal role, as evidenced by our moderation analysis. Interestingly, a family business background acts as a catalyst, enhancing how effectively digital skills translate into entrepreneurial drive. This aligns with social cognitive perspectives: when personal capabilities meet the right environmental exposure, the "spark" for venture creation is much stronger.

To capture the complexity of these interactions, the fsQCA (configurational analysis) reveals a pattern of equifinality. We found that there is not just one "right" way to develop high digital entrepreneurial intention. Whether an individual is driven by technology, passion, or a balance of both, these different configurations prove that entrepreneurial outcomes emerge from a unique interplay of conditions rather than any single factor alone.

Lastly, by treating digital literacy as a multidimensional, second-order construct, this study answers the call for a more sophisticated understanding of digital competence. By integrating AI, Fintech, and general digital skills, we highlight that "digital readiness" is a holistic asset, shaping how modern individuals perceive their own capability to innovate and lead.

5.2. Practical implications

These findings carry significant weight for universities and policymakers aiming to ignite the digital entrepreneurship engine.

For higher education institutions, the results call for a strategic pivot: entrepreneurship education can no longer exist in a silo. It must be woven into the fabric of interdisciplinary curricula, where AI literacy, Fintech, and core digital skills are treated as essential tools for any modern venture. Beyond theory, the critical role of digital self-efficacy (DESE) suggests that we need to lean more heavily into experiential learning. By prioritizing hands-on simulations, incubation programs, and direct industry collaboration, universities can provide those "mastery experiences" that truly build a student's confidence to launch.

It is also clear that the mindset is just as important as a skill. Since perceived desirability is such a strong driver, institutions should focus on "humanizing" the entrepreneurial path. This means moving beyond the classroom to offer mentorship, exposure to real-world startup ecosystems, and regular interaction with successful founders. Such initiatives help rebrand entrepreneurship from a "risky gamble" to a viable, attractive career, particularly for students who might otherwise feel hesitant.

Interestingly, the data regarding family business backgrounds tells us that a "one-size-fits-all" model will not work. While some students arrive with a built-in entrepreneurial compass, others start from nothing and need more foundational support, role models, and structured mentoring. Our configurational findings reinforce this need for flexibility: because there are multiple pathways to becoming an entrepreneur, educational strategies should be personalized enough to meet students wherever they are in their journey.

From a policy perspective, the focus must shift toward building an enabling ecosystem. While investment in digital infrastructure is the baseline for equity, the real impact comes from integrating digital entrepreneurship into the broader national education strategy. This ensures a tighter alignment between what is taught and what the economy needs. Lastly, by lowering entry barriers through accessible funding and nurturing regional innovation hubs, policymakers can turn latent intentions into active, thriving digital ventures.

6. CONCLUSION

6.1. Conclusion

This study offers a mechanism-based explanation of how digital literacy fuels entrepreneurial intent among university students, specifically within the dynamic landscape of an emerging economy. By synthesizing the Entrepreneurial Event Model and Social Cognitive Career Theory, our analysis moves beyond simple correlations. We demonstrate that digital competencies do not act in isolation; rather, they trigger a structured psychological sequence where self-efficacy and perceived desirability serve as vital links.

The findings reveal that digital literacy does more than just provide technical skills; it builds the internal confidence necessary to navigate complex technologies. This newfound confidence, in turn, pivots an individual's perspective, making entrepreneurship feel like a more "attainable" and attractive career path. However, this journey is not universal. The influence of a family business background reminds us that context matters; prior exposure to

business environments acts as a catalyst, smoothing the transition from "having the skills" to "having the intent."

To capture the true complexity of this phenomenon, we complemented our linear findings with a configurational analysis. This approach reveals a more nuanced reality: there is no single "golden path" to digital entrepreneurial intention. Instead, intention emerges through multiple, diverse combinations of cognitive and environmental factors. This effectively challenges the oversimplified view that more skills automatically lead to more entrepreneurs, underscoring that digital entrepreneurship is an inherently multi-faceted process.

This research bridges the gap between digital competency frameworks and established psychological theories. By blending variance-based and configurational approaches, we provide a more holistic account of how digital readiness, individual mindset, and personal history converge to shape the entrepreneurs of tomorrow.

6.2. Limitations and future research

Despite the insights gained, several limitations warrant careful consideration.

Most importantly, the cross-sectional nature of this study means we can only capture a "snapshot" in time, which inherently restricts our ability to draw definitive causal inferences. Since entrepreneurial intention is often a fluid process, future longitudinal designs would be invaluable in tracking how these digital competencies evolve into long-term outcomes. Furthermore, because the study relies on self-reported data, there is an inevitable risk of common method bias or social desirability effects. Moving forward, incorporating objective metrics such as performance-based technical assessments would provide a more rigorous validation of an individual's true digital proficiency.

The scope of the study also presents certain geographical and behavioral boundaries. By focusing on a single-country context, the generalizability of our findings to unfamiliar cultural or institutional landscapes remains an open question. We encourage future comparative research to test these relationships across diverse borders. Additionally, we must acknowledge the gap between intention and action. While we have mapped the drivers of intention, the transition from "planning" to "actual venture creation" is often fraught with obstacles that this study does not measure, but which future research should certainly explore.

Lastly, while we focused on family background as a primary contextual factor, it is likely that other environmental forces such as institutional support, peer networks, and regional economic stability also play significant roles. Moreover, as digital technologies like blockchain, data analytics, and immersive tech continue to redefine the market, our conceptualization of digital literacy must also remain dynamic. Expanding the current framework to include these emerging domains will be essential for a truly future-proof understanding of digital readiness.

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