

Entrepreneurship Education, Digital Literacy, and Digital Entrepreneurial Intention: The Mediating Role of Entrepreneurial Self-Efficacy

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Abstract: This study examines the effects of entrepreneurship education and digital literacy on digital entrepreneurial intention, with entrepreneurial self-efficacy positioned as a mediating variable among vocational education students. A quantitative explanatory design was employed, involving 130 students enrolled in digital business and marketing programs. Respondents were selected using proportionate stratified random sampling, and the data were analyzed using Partial Least Squares Structural Equation Modeling. The findings show that entrepreneurship education does not directly influence digital entrepreneurial intention, whereas digital literacy has a significant positive effect. Entrepreneurial self-efficacy also significantly enhances digital entrepreneurial intention and serves as a key psychological mechanism linking entrepreneurship education to students' intention to pursue digital entrepreneurship. Entrepreneurship education significantly strengthens entrepreneurial self-efficacy, indicating that educational experiences contribute to students' confidence in identifying and developing digital business opportunities. In contrast, digital literacy does not significantly influence entrepreneurial self-efficacy and has no indirect effect on digital entrepreneurial intention through self-efficacy. These findings demonstrate that digital capability and entrepreneurial confidence operate through different pathways in shaping digital entrepreneurial intention. The study highlights the need for vocational entrepreneurship education to move beyond theoretical instruction by incorporating experiential learning, digital business projects, and confidence-building activities that enable students to translate entrepreneurial knowledge into digital venture intentions.

Keywords: Entrepreneurship Education, Digital Literacy, Digital Entrepreneurial Intention, Entrepreneurial Self-Efficacy, Vocational Education

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INTRODUCTION

Advances in digital technology have transformed various sectors, including the world of entrepreneurship, giving rise to the concept of digital entrepreneurship. Digital entrepreneurship refers to the activity of creating and developing businesses by utilising digital technology and internet-based platforms to generate value and capitalise on opportunities within the digital ecosystem (Giones & Brem, 2017; Zamzami, 2021; Shriha, 2025). Technological advances have

simplified business processes through marketing on marketplaces and social media, offering lower costs and a wider market reach (Bui & Duong, 2024). These conditions present an opportunity for vocational school students—as a generation familiar with digital technology—to develop digital-based entrepreneurship.

The growth of the digital economy in Indonesia shows tremendous potential year after year. According to a 2025 survey by the Indonesian Internet Service Providers Association (APJII), the number of internet users in Indonesia reached 229 million, or 80.66% of the population. This figure represents a significant increase of 1.16% compared to the previous year, with the user base dominated by the younger generation at 34.40%. This younger generation—including vocational high school (SMK) students—has the highest level of access to digital technology through the use of smartphones and social media in their daily lives (Arif, et al., 2025). This growth aligns with the projected e-commerce transaction value in Indonesia for 2025, which is expected to continue rising to reach between 71 and 80 billion dollars (Badan Pusat Statistik, 2025). This trend indicates that the Indonesian public—particularly the younger generation—is highly active in engaging with the digital ecosystem, especially in online shopping activities. However, the high rate of internet usage has not yet been fully matched by productive use of technology. The majority of the population still acts as digital consumers rather than digital entrepreneurs.

Looking at the situation in Indonesia, there is an imbalance between the number of job openings and the labor force. According to data from the Central Statistics Agency (BPS) for 2025, the unemployment rate in Indonesia reached 14.06 percent (BPS, 2026). This figure is significantly higher than in the previous year. The highest unemployment rates are concentrated among vocational high school (SMK) graduates, and this is the primary cause of rising unemployment in Indonesia. In Madura as well, the highest unemployment rates across all subdistricts are concentrated among SMK graduates. This highlights the gap between the goals of vocational education—which is intended to prepare graduates to enter the workforce—and the reality of their limited ability to start their own businesses. Therefore, strengthening digital entrepreneurial intention among SMK students is a strategic step toward fostering digital entrepreneurship while also helping to reduce unemployment.

This study is based on the Theory of Planned Behavior (TPB) proposed by Ajzen (1991) as a theoretical framework to explain the formation of individual behavioral intentions. This theory states that intention is the primary factor determining the emergence of a behavior, as it reflects an individual's readiness and commitment to perform a specific action (Kusumaningrum & Kusnendi, 2022). In the context of digital entrepreneurship, digital entrepreneurial intention is a crucial aspect that reflects students' desire to utilize digital technology in creating and developing digital-based businesses. According to the study by Faikha & Nurlaili (2025), entrepreneurial intention represents an individual's initial commitment to starting a new business and thus serves as a key indicator prior to actual engagement in entrepreneurial behavior. For vocational school students who are being prepared as job-ready graduates or as job creators, strengthening digital entrepreneurial intent is crucial, as digital entrepreneurial activities require the courage to seize opportunities, the ability to adapt to technology, and perseverance in the face of the uncertainties of the digital business environment (Munthe & Nawawi, 2023). Digital entrepreneurial intent can be influenced by both external and internal factors. External factors include entrepreneurship education, which plays a role in shaping digital entrepreneurial knowledge and skills, as well as proficiency in digital technology.

Entrepreneurship education plays a key role in shaping the intention to become a digital entrepreneur. Entrepreneurship education has been recognized as a determinant of entrepreneurial intention (Cui & Bell, 2022; Cassol et al., 2022). Entrepreneurship education fosters an entrepreneurial mindset and increases entrepreneurial self-efficacy by equipping

students with the knowledge, skills, and experience related to business creation and management (Duong & Vu, 2026). Furthermore, it can encourage students to choose digital entrepreneurship after graduation, as through entrepreneurship lessons, students can gain an understanding of various ways to start a business and develop the confidence to run one (Santoso, 2021). Students who have received entrepreneurship education tend to have a higher level of readiness and intention to start a digital business. This is supported by research by Wibowo et al. (2023), who found that education significantly influences the intention to start a business utilizing digital technology. This finding is consistent with research by Zeynalov (2025), Duong & Vu (2025), Bui et al. (2025), Masli (2026), and Liang et al. (2026). (2025), who found that entrepreneurship education (EE) has a positive and significant influence on the intention to engage in digital entrepreneurship. However, research by Mugiono et al. (2020) and Adelaja (2025) showed that entrepreneurship education has a negative relationship with digital entrepreneurship intention. Furthermore, Yordanova (2020) showed that entrepreneurship education has no significant effect on technopreneurial intention. These research results indicate a research gap, so researchers want to conduct research to examine the results using similar variables.

In addition to entrepreneurship education, digital literacy has also been shown to be a determinant of digital entrepreneurial intentions. Digital literacy encompasses the ability to use information and communication technology effectively and efficiently in a business context. This includes the use of social media for marketing, data analysis for decision-making, and an understanding of digital security and privacy. According to Koltay (2011), digital literacy refers to an individual's awareness, attitude, and ability to use digital tools and facilities appropriately. Digital literacy not only influences technical skills but also fosters a positive attitude towards entrepreneurship, which in turn encourages students' intention to start a business (Trisianto & Noviani, 2024; Filda et al., 2025). Students with a high level of digital literacy will be more adaptable to technological changes and exploit opportunities in the digital business world (Anwar & Herayono, 2024). However, research by Alkhalaileh (2023) shows that digital literacy does not significantly influence the intention to become a digital entrepreneur.

Besides external factors, another challenge still faced by vocational school students specializing in Digital Business and Marketing is a lack of self-confidence in digital entrepreneurship. Although students have received entrepreneurship training and have extensive access to digital technology, not all of them have the confidence to start a business independently. This is demonstrated by the tendency of vocational school graduates to prefer looking for work rather than creating job opportunities, because they feel unsure about their abilities and readiness to run a digital business (Reffandi & Sulistyowati, 2024). Therefore, student self-confidence is an important psychological factor that needs to be considered in fostering intentions to engage in digital entrepreneurship. Thus, researchers identified entrepreneurial self-efficacy as a mediating variable that explains how entrepreneurship education and digital literacy can increase students' intentions to engage in digital entrepreneurship. Entrepreneurial self-efficacy is the belief in one's ability to organize, manage, and execute the actions necessary to achieve success in entrepreneurship. Therefore, entrepreneurial self-efficacy serves as an indicator to encourage digital entrepreneurship intentions (Nguyen, 2020). Based on the findings of a study by Yuliana et al. (2020), Latif (2022), Nurjahan et al. (2025), Pham et al. (2024) and Khoiriyah et al. (2022), it is clear that entrepreneurial self-efficacy

Although extensive research on digital entrepreneurial intention has been conducted, several research gaps remain. First, research on the influence of entrepreneurship education and digital literacy on digital entrepreneurial intention still shows inconsistent findings. Second, most

studies focus more on general entrepreneurial intention than on digital entrepreneurial intention. Third, previous research has predominantly focused on university students, while studies on vocational high school students are relatively limited. Fourth, most studies only examine direct relationships between variables, while research examining the role of entrepreneurial self-efficacy as a mediating variable in the context of digital entrepreneurship is still limited.

Based on these gaps, this study offers several novelties. This study develops a model that integrates entrepreneurship education, digital literacy, and entrepreneurial self-efficacy to explain the formation of digital entrepreneurial intention in vocational high school students within the framework of the Theory of Planned Behavior. Furthermore, this study uses objective tests to measure digital literacy, thus more accurately depicting students' digital abilities than perception-based measurements commonly used in previous studies. The focus of this study on vocational high school students with digital business and marketing expertise in Madura also provides empirical context, which is still limited in research on digital entrepreneurial intention.

Based on the research gap, this study develops a model that integrates entrepreneurship education, digital literacy, and entrepreneurial self-efficacy to explain the formation of digital entrepreneurial intention in Digital Business and Marketing Expertise students of SMK Negeri 1 Sumenep, SMK Negeri 1 Pamekasan, SMK Negeri 1 Sampang, and SMK Negeri 1 Bangkalan SMKN within the Theory of Planned Behavior (TPB) framework. This study is expected to provide theoretical contributions by expanding the application of TPB through an explanation of the role of entrepreneurial self-efficacy as a psychological mechanism that connects entrepreneurship education and digital literacy with digital entrepreneurial intention. In addition, this study provides empirical evidence regarding the formation of digital entrepreneurial intention in vocational high school students through measuring digital literacy using objective tests.

METHOD

This study uses a quantitative approach with an explanatory research design that aims to analyze the causal relationship between entrepreneurship education, digital literacy, entrepreneurial self-efficacy, and digital entrepreneurial intention. The study population consisted of 317 students in grades XI and XII of the Digital Business and Marketing Expertise Program at four state vocational schools in Madura: SMK Negeri 1 Sumenep, SMK Negeri 1 Pamekasan, SMK Negeri 1 Sampang, and SMK Negeri 1 Bangkalan. The sample size was determined based on the recommendations of Hair et al. (2018) for Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, which is at least ten times the number of indicators used in the research model. This study used 13 indicators, so the minimum sample size required was 130 respondents. Furthermore, the sample was distributed to each school using a proportionate stratified random sampling technique so that the number of respondents in each school was proportional to the population. The sample size for each stratum was calculated using the formula: $N_i = n \times N_i / N$

Table 1. Sample

School	Number of Students	Proportion	Sample
SMK Negeri 1 Sumenep	172	172/ 317 0,54 x 130	70
SMK Negeri 1 Pamekasan	76	76/ 317 0,24 x 130	32
SMK Negeri 1 Sampang	35	35/ 317 0,11x 130	14

School	Number of Students	Proportion	Sample
SMK Negeri 1 Bangkalan	34	34/ 317 0,10 x 130	14
Amount			130

The study used two types of instruments: entrepreneurship education, entrepreneurial self-efficacy, and digital entrepreneurial intention, measured using a questionnaire adapted from previous research according to each construct. The questionnaire used a four-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The use of a four-point scale aims to avoid neutral answers so that respondents can provide more assertive opinions. This has been proven by research by Pismanji (2021), which stated that the use of a four-point Likert scale is considered effective in obtaining more definitive and accurate data regarding respondents' perceptions. The digital entrepreneurial intention variable is measured using three indicators: interest in online entrepreneurship, encouragement to start an online business, and readiness for online entrepreneurship (Pramono et al., 2025). The entrepreneurship education variable is measured through three indicators: educational programs that foster entrepreneurial desire, increase entrepreneurial knowledge and insight, and awareness of business opportunities (Falah et al., 2022). Entrepreneurial self-efficacy is measured using three dimensions: magnitude, strength, and generality (Manullang, 2022; Ratnasari, 2020). Knowledge construction (Maudina, 2022; Abdul et al., (2023).

The digital literacy variable was measured using a multiple-choice objective test to measure students' actual ability to utilize digital technology in an entrepreneurial context. The instrument was structured based on four indicators: Internet search, Hypertext guidance, Information content evaluation, and Knowledge organization. The test consisted of 20 questions, with five questions for each indicator. Before being used in the study, all questionnaire instruments and objective tests were tested for validity and reliability to ensure they were suitable for use as data collection tools. The indicators for each variable are as follows.

Data collection was conducted after obtaining permission from each school. Data were collected online using Google Forms. Data analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach using SmartPLS version 4.0.9. The analysis included two stages: evaluation of the measurement model (outer model) and the structural model (inner model). Evaluation of the outer model included testing convergent validity based on Outer Loadings and Average Variance Extracted (AVE) values, discriminant validity using the Heterotrait-Monotrait Ratio (HTMT), and construct reliability based on Cronbach's Alpha (CA) and Composite Reliability (CR) values. Furthermore, evaluation of the inner model was carried out through testing the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), model fit test, and hypothesis testing using the bootstrapping procedure. The hypothesis was declared supported if the t-statistic value > 1.96 and p-value < 0.05 .

RESULTS AND DISCUSSION

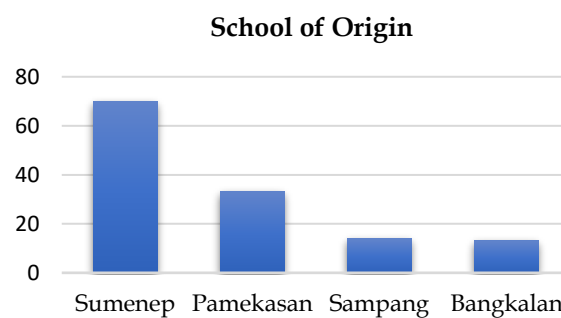


Figure 1. Characteristics of Respondents by School of Origin

As shown in Figure 1, the respondents in this study were drawn from public vocational high schools (SMK) in Madura specializing in Digital Business and Marketing (BDP): 70 students

from SMK Negeri Sumenep, 32 students from a public vocational high school in Pamekasan, 14 students from a public vocational high school in Sampang, and 14 students from a public vocational high school in Bangkalan.

Research Results

Outer Model

Convergent Validity

Table 2. Convergent Validity (Outer Loadings)

Variable	Item	OuterLoadings
Entrepreneurship Education (X1)	X1.1	0.819
	X1.2	0.822
	X1.3	0.781
	X1.4	0.754
	X1.5	0.732
	X1.6	0.756
Digital Literacy (X2)	X1.7	0.752
	X2.1	0.819
	X2.2	0.794
	X2.3	0.793
	X2.4	0.725
	X2.5	0.791
	X2.6	0.759
	X2.7	0.823
	X2.8	0.765
	X2.9	0.713
	X2.10	0.733
	X2.11	0.737
	X2.12	0.744
	X2.13	0.78
	X2.14	0.796
	X2.15	0.821
Entrepreneurial Self-Efficacy (Z)	X2.16	0.873
	Z1.1	0.799
	Z1.2	0.808
	Z1.3	0.804
	Z1.4	0.758
	Z1.5	0.799
	Z1.6	0.832
	Z1.7	0.802
Digital Entrepreneurial Intention (Y)	Z1.8	0.789
	Y1.1	0.773
	Y1.2	0.788
	Y1.3	0.779
	Y1.4	0.76
	Y1.5	0.804
	Y1.6	0.79
	Y1.7	0.785
	Y1.8	0.767
	Y1.9	0.795

Source: SmartPLS4 Outer Model Output (2026)

The results of the data analysis in Table 2 show that the items for each variable have outer loadings greater than 0.70, thereby confirming their validity. The convergent validity test also utilised the AVE test, with the results shown in Table 2 below.

Table 3. Test Results AVE

Variable	AVE
Digital Entrepreneurial Intention	0.612
Digital Literacy (X2)	0.622
Entrepreneurship Education (X1)	0.606
Entrepreneurial Self-Efficacy (Z)	0.642

Source: SmartPLS4 Outer Model Output (2026)

Table 3 shows the Average Variance Extracted (AVE) results for the DEI variable (0.612), the DL variable (0.622), the EE variable (0.606) and the ESE variable (0.642). These results indicate that each variable has an AVE value greater than 0.50, thus demonstrating convergent validity.

Discriminant Validity

Table 4. Discriminant Validity (HTMT)

	DEI	DL	EE	ESE
DEI				
DL	0.191			
EE	0.631	0.121		
ESE	0.735	0.085	0.802	

Source: SmartPLS4 Outer Model Output (2026)

Based on Table 4, the discriminant validity test results using the Heterotrait-Monotrait Ratio (HTMT) method show that the inter-construct values are below 0.90. This demonstrates that all variables are unique and possess adequate discriminant validity.

Reliability Test

Table 5. Reliability Test Results

	Cronbach's alpha (CA)	Composite reliability (CR)
Entrepreneurship Education (X1)	0.890	0.895
Digital Literacy (X2)	0.953	0.965
Entrepreneurial Self-Efficacy (Z)	0.920	0.920
Digital Entrepreneurial Intention (Y)	0.921	0.923

Source: SmartPLS4 Outer Model Output (2026)

Based on the table above, all variables entrepreneurship education, digital literacy, entrepreneurial self-efficacy, and digital entrepreneurial intention are declared reliable. This is because each construct has a Cronbach's Alpha value above 0.60 and a Composite Reliability value above 0.70. Therefore, all constructs are declared reliable.

Uji Inner Model

Uji R-Square

Table 6. R-Square Test Results

Variabel	R-square
Digital Entrepreneurial Intention	0.492
Entrepreneurial Self-Efficacy	0.528

Source: SmartPLS4 Inner Models Output (2026)

Based on the table above, the R-squared value for the Digital Entrepreneurial Intention variable is 0.492, indicating that 49,2% of the variation in that construct can be explained by the independent variables in the model, whilst the Entrepreneurial Self-Efficacy variable has an R-squared value of 0.528, indicating that 52,8% of the variation in that variable is explained by the constructs in this model. Referring to statistical classification criteria, both results fall into the

‘moderate’ category as they lie within the contribution range of >33 per cent, whilst the remaining percentage for each variable is influenced by other factors outside the scope of this study.

Uji Q-Square (Q2)

Q-Square aims to assess the extent to which observations influence the research model. The results of the Q2 test are shown in the table below.

Table 7. Q-Square Test

Variabel	Q-Square
Entrepreneurial Self-Efficacy (Z)	0,332
Digital Entrepreneurial Intention (Y)	0,267

Source: SmartPLS4 Inner Models Output (2026)

Based on table 7, the Q^2 value for Entrepreneurial Self-Efficacy is 0.332 and Digital Entrepreneurial Intention is 0.267. Because both values are greater than zero, the model has good predictive relevance.

F-Square (F^2)

The F-square (F^2) test aims to determine the extent to which the independent variable influences the dependent variable. The results of the F^2 test are shown in the following table.

Table 8. F-Square (F^2) Entrepreneurial Self-Efficacy (Z)

	Entrepreneurial Self-Efficacy (Z)	Interpretasi
Entrepreneurship Education (X1)	1.150	Major Influence
Digital Literacy (X2)	0.001	No Impact

Source: SmartPLS4 Inner Models Output (2026)

Based on the results of the F^2 test in the table above, the F^2 value for the relationship between Entrepreneurship Education (X1) and Entrepreneurial Self-Efficacy (Z) was found to be 1.150, which falls into the category of a large effect as the value far exceeds the threshold of 0.35. Meanwhile, the relationship between Digital Literacy (X2) and Entrepreneurial Self-Efficacy (Z) yielded an F^2 value of 0.001, which falls into the ‘no effect’ category as it is below the minimum contribution threshold of 0.02.

Table 9. F-Square (F^2) for Digital Entrepreneurial Intention (Y)

	Digital Entrepreneurial Intention (Y)	Interpretasi
Entrepreneurship Education (X1)	0.025	Weak Influence
Digital Literacy (X2)	0.048	Weak Influence
Entrepreneurial Self-Efficacy (Z)	0.290	Moderate Influence

Source: SmartPLS4 Inner Models Output (2026)

Table 9 shows that entrepreneurship education (X1) has an f^2 value of 0.025 on digital entrepreneurial intention (Y), while digital literacy (X2) has an f^2 value of 0.048. Both variables have a small influence on digital entrepreneurial intention. Meanwhile, entrepreneurial self-efficacy (Z) has an f^2 value of 0.290, which indicates a moderate influence on digital entrepreneurial intention. These results indicate that entrepreneurial self-efficacy makes a greater contribution in explaining variations in digital entrepreneurial intention compared to entrepreneurship education and digital literacy.

Uji model Fit

Table 10. Model Fit Test Results

Parameter	Value	Description
SRMR	0.080	Fit
NFI	0.672	Not Fit

Source: SmartPLS4 Output (2026)

Based on Table 10 the Standardized Root Mean Square Residual (SRMR) value in this result is 0.080, which is smaller than 0.10, so it can be concluded that this model has a good fit. While the Normed Fit Index (NFI) value is close to 1, indicating an increasingly good model, but in this result the NFI obtained is 0.672, which is still quite far from the ideal value of ≥ 0.90 .

Hypothesis Testing Results

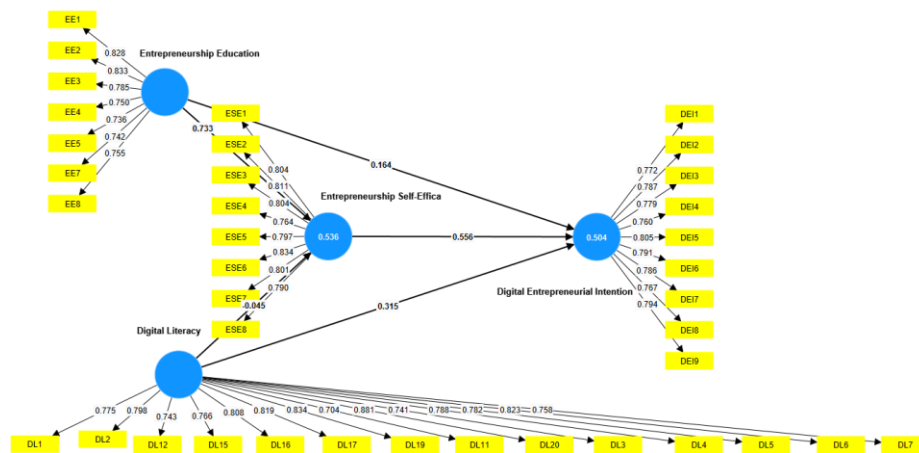


Figure 2. Results of the Path Diagram for Testing the Outer Model and the Inner Model

Hypothesis testing was carried out using t-tests and P-values. This test was conducted to determine the research findings, namely the effect of the variables under investigation. A research variable can be considered to have a significant effect if its t-value is greater than 1.96 and its P-value is less than 0.05.

Table 11. Hypothesis Test Results (Bootstrapping)

Effect Between Variables	Original Sample	t- Stasistic	P Values	Conclusion
Entrepreneurship Education (X1) → Digital Entrepreneurial Intention (Y)	0.164	1.62	0,105	H1 rejected
Digital Literacy (X2) → Digital Entrepreneurial Intention (Y)	0.315	2.14	0,032	H2 accepted
Entrepreneurial Self-Efficacy (Z) → Digital Entrepreneurial Intention (Y)	0,556	5,103	0,000	H3 accepted
Entrepreneurship Education (X1) → Entrepreneurial Self-Efficacy (Z)	0,733	13,413	0,000	H4 accepted
Digital Literacy (X2) → Entrepreneurial Self-Efficacy (Z)	-0,045	0,282	0,778	H5 rejected

Entrepreneurship Education (X1) → Entrepreneurial Self-Efficacy (Z) → Digital Entrepreneurial Intention (Y)	0,408	5,203	0,000	H6 accepted
Digital Literacy (X2) → Entrepreneurial Self-Efficacy (Z) → Digital Entrepreneurial Intention (Y)	-0,025	0,268	0,789	H7 rejected

Source: Data Processed by Researchers (2026)

Based on Table 11, it shows that H2, H3, H4, and H6 are accepted because they have a t-statistic value > 1.96 and p-value < 0.05 . Meanwhile, H1, H5, and H7 are rejected because they have a t-statistic value < 1.96 and p-value > 0.05 . These results indicate that digital literacy (X2) is significantly related to digital entrepreneurial intention (Y), while entrepreneurial self-efficacy (Z) is also significantly related to digital entrepreneurial intention (Y). In addition, entrepreneurship education (X1) is significantly related to entrepreneurial self-efficacy (Z) and has an indirect effect on digital entrepreneurial intention (Y) through entrepreneurial self-efficacy (Z). Conversely, entrepreneurship education (X1) does not show a direct relationship with digital entrepreneurial intention (Y), while digital literacy (X2) does not have a significant relationship with entrepreneurial self-efficacy (Z) nor an indirect effect on digital entrepreneurial intention (Y) through entrepreneurial self-efficacy (Z).

Discussion

The Impact of Entrepreneurship Education on Digital Entrepreneurial Intention

The results of the hypothesis testing indicate that entrepreneurship education has no effect on digital entrepreneurial intention. These results suggest that the entrepreneurship education received by vocational high school students in Madura has not yet been able to directly increase their intention to establish digital-based businesses. Although students have been equipped with entrepreneurial knowledge at school, this knowledge has not yet been able to directly encourage the emergence of a desire to engage in digital entrepreneurship. These findings are consistent with the research by Reffandi et al. (2026), which states that the educational process alone is not sufficient to encourage students to develop a strong intention to start a business.

Further research by Mugiono et al. (2020), Adelaja (2025) and Yordanova (2020) indicates that entrepreneurship education does not have a direct impact on digital entrepreneurial intention. The consistency of these findings suggests that entrepreneurship education does not necessarily foster digital entrepreneurial intention if the teaching provided fails to build individuals' confidence in their ability to run a digital business.

These findings are supported by the results of descriptive analysis on the entrepreneurship education variable. Item EE6, namely "Entrepreneurship lessons helped me develop the insights needed to become a digital entrepreneur," received the lowest average score compared to the other items. This result indicates that the entrepreneurship learning received by students has not been able to broaden their knowledge regarding the characteristics, opportunities, and implementation of digital-based businesses. This finding is reinforced by the results of interviews with students who stated that the entrepreneurship material was explained briefly before the practice, so they did not fully understand the application of the material in the context of digital business. This condition indicates that the learning process has not provided an optimal learning experience to build students' understanding of digital entrepreneurship and therefore has not been able to encourage the formation of digital entrepreneurial intention.

The findings of this study can be explained through the Theory of Planned Behavior (Ajzen, 1991), which states that a person's intention to perform a behavior is influenced by attitude toward the behavior, subjective norms, and perceived behavioral control. The results indicate that the entrepreneurship education received by students is insufficient to create conditions that support the emergence of digital entrepreneurial intention. Suboptimal understanding of digital entrepreneurship results in students lacking a strong foundation for developing digital entrepreneurial intentions. Therefore, the entrepreneurship education provided is not yet able to directly shape digital entrepreneurial intention.

These findings provide a theoretical contribution by demonstrating that, in the context of vocational high school students, entrepreneurship education does not automatically increase digital entrepreneurial intention. The results indicate that the effectiveness of entrepreneurship education depends not only on the delivery of material and implementation of practices, but also on the ability of the learning process to build a relevant understanding of digital entrepreneurship. Thus, this study extends the application of the Theory of Planned Behavior to the context of digital entrepreneurship by demonstrating that entrepreneurship education alone is insufficient to directly shape digital entrepreneurial intentions.

The Influence of Digital Literacy on Digital Entrepreneurial Intention

Hypothesis testing results indicate that digital literacy significantly influences digital entrepreneurial intention. These findings suggest that the greater a student's ability to utilize digital technology, the greater their intention to establish a digital-based business. The ability to search for information, utilize digital media, communicate online, and evaluate information makes it easier for students to identify digital business opportunities. Thus, students are not only using technology for entertainment but are also beginning to see technology as a means to create economic value through entrepreneurial activities.

The results of this study align with various empirical studies showing that digital literacy is a crucial factor in shaping digital entrepreneurial intention. According to Latif (2022), Pramono et al. (2025) found that digital literacy plays a significant role in increasing students' digital entrepreneurial intentions. These findings are also supported by Mugiono et al. (2020) and Liang et al. (2025), who revealed that the higher the level of digital literacy possessed by students, the greater their tendency to recognize digital business opportunities and their intention to start a digital business.

These findings can be explained through Ajzen's Theory of Planned Behavior (TPB), which states that a person's intention to perform a behavior is influenced by attitude toward behavior, subjective norms, and perceived behavioral control. In this study, digital literacy contributes to shaping attitudes toward behavior toward digital entrepreneurship. Students' ability to access, understand, evaluate, and utilize digital information makes it easier for them to recognize business opportunities, understand the benefits of technology in business activities, and view digital entrepreneurship as an attractive option to develop. This increasingly positive attitude toward digital entrepreneurship encourages increased digital entrepreneurial intention. Therefore, digital literacy directly influences digital entrepreneurial intention.

These findings are supported by the results of objective digital literacy tests, which show that most students at SMKN 1 Sumenep, SMKN 1 Pamekasan, SMKN 1 Sampang, and SMKN 1 Bangkalan have good skills in accessing, understanding, evaluating, and utilizing digital information. These skills enable students to obtain information about business opportunities, learn digital marketing strategies, and understand technological developments that can be utilized in entrepreneurial activities. This condition indicates that digital literacy not only plays a

role in improving the ability to use technology but also helps students see technology as a means to create business opportunities.

These findings provide a theoretical contribution by demonstrating that digital literacy is a crucial factor in shaping digital entrepreneurial intention in vocational high school students. The results of this study extend the application of the Theory of Planned Behavior by demonstrating that mastery of digital competencies not only supports technology use but also shapes entrepreneurial intention by enhancing students' ability to recognize and exploit digital business opportunities.

The Effect of Entrepreneurial Self-Efficacy on Digital Entrepreneurial Intention

The results of the hypothesis testing indicate that entrepreneurial self-efficacy has a significant influence on digital entrepreneurial intention. This finding indicates that the higher students' confidence in their ability to run a digital business, the higher their intention to become digital entrepreneurs. Students who are confident in their ability to recognize opportunities, make decisions, and manage a digital business tend to have a greater desire to start a business.

The results of this study are in line with research by Nurjahan et al. (2025), Nurhayati et al., (2020), which found that Entrepreneurial Self-Efficacy has a positive effect on digital entrepreneurial intention. The study explained that individuals who have high confidence in their abilities will be more optimistic in facing challenges, more willing to take risks, and have a stronger commitment to starting a digital-based business. The results of this study are also supported by Pham et al., (2024b) and Ridwan et al., (2025) who stated that Entrepreneurial Self-Efficacy is an important factor in increasing digital entrepreneurial intention, because students who have high confidence in their abilities tend to be more ready to take advantage of business opportunities and are more confident in realizing their business ideas.

The findings of this study are in line with the Theory of Planned Behavior (TPB). In this study, Entrepreneurial Self-Efficacy represents perceived behavioral control, namely students' confidence in their ability to start, manage, and develop a digital business. The higher the students' perception that they are capable of carrying out entrepreneurial activities, the greater their tendency to form an intention to start a digital business. Thus, the results of this study indicate that perceived behavioral control is one of the factors that plays an important role in forming digital entrepreneurial intention in digital business and marketing (BDP) students at SMKN 1 Sumenep, SMKN 1 Pamekasan, SMKN 1 Sampang, and SMKN 1 Bangkalan.

This study provides a theoretical contribution by demonstrating that entrepreneurial self-efficacy is a psychological factor that plays a significant role in shaping digital entrepreneurial intention in vocational high school students. These findings strengthen the application of the Theory of Planned Behavior, particularly in the aspect of perceived behavioral control, by demonstrating that self-confidence is a factor driving the formation of digital entrepreneurial intention.

The Effect of Entrepreneurship Education on Entrepreneurial Self-Efficacy

The results of the hypothesis testing indicate that entrepreneurship education has a significant effect on entrepreneurial self-efficacy. This finding suggests that the better the entrepreneurship education students receive, the higher their confidence in their ability to run a business. Through entrepreneurship education, students gain knowledge, experience, and opportunities to understand the entrepreneurial process, thereby increasing their confidence in facing entrepreneurial activities.

The results of this study align with those of Wishnu et al. (2020), which demonstrated that entrepreneurship education plays a significant role in enhancing entrepreneurial self-efficacy.

These findings demonstrate that entrepreneurship education, which equips students with the knowledge, skills, and understanding of the entrepreneurial process, can enhance individual confidence in their ability to undertake entrepreneurial activities. Through this learning process, students gain an understanding of how to identify business opportunities, plan their business, and resolve various problems they may encounter in business activities. This knowledge and understanding form the basis for developing self-confidence in their ability to undertake entrepreneurial activities. These findings are also supported by those of Wu et al. (2022) and Wardana et al. (2020), which state that entrepreneurship education has a positive effect on entrepreneurial self-efficacy.

Based on the Theory of Planned Behavior (TPB) proposed by Ajzen, a person's intention to perform a behavior is influenced by attitude toward behavior, subjective norms, and perceived behavioral control. In this study, entrepreneurial self-efficacy represents perceived behavioral control, namely students' perceptions of their abilities to carry out entrepreneurial activities. The results of the study indicate that entrepreneurship education can increase perceived behavioral control by providing knowledge and learning experiences that help students understand the entrepreneurial process and recognize their abilities. However, these learning experiences have not fully formed a strong attitude toward digital entrepreneurship (attitude toward behavior), so entrepreneurship education has not had a direct influence on digital entrepreneurial intention. Thus, entrepreneurship education plays a greater role in shaping students' psychological readiness by increasing entrepreneurial self-efficacy, which then becomes the basis for the formation of digital entrepreneurial intention.

The Impact of Digital Literacy on Self-Confidence in Entrepreneurship

The research results show that digital literacy does not significantly impact entrepreneurial self-efficacy. This finding suggests that students' digital literacy levels have not yet increased their confidence in their ability to undertake entrepreneurial activities. Although students have the skills to access information, use digital media, and utilize technology, these skills do not necessarily translate into the confidence to start or manage a digital business.

This research is in line with the research of Rahman & Wulandari, (2025) which stated that Digital Literacy does not affect entrepreneurial self-efficacy. The study stated that high digital skills do not always increase self-confidence in entrepreneurship because students can become more aware of the complexities and challenges in running a digital business. However, the results of this study differ from the research of Yulastri et al. (2026) and Florentina et al. (2025) which showed that digital literacy has a positive and significant effect on Entrepreneurial Self-Efficacy. The difference in the results of this study is thought to be caused by differences in respondent characteristics, learning environments, and the intensity of digital technology use in entrepreneurial activities, so that digital literacy skills in each study have a different influence on the formation of Entrepreneurial Self-Efficacy.

This situation can be explained by the characteristics of the research respondents: Vocational high school students in Madura mostly utilize digital technology for learning, communication, entertainment, and social media, rather than for business activities or business development. Consequently, their digital skills have not directly increased their confidence in their ability to become digital entrepreneurs. In other words, students' digital literacy is still general and has not been integrated with digital entrepreneurship skills.

Based on the Theory of Planned Behavior (TPB) perspective, a person's behavior is influenced by perceived behavioral control, namely the individual's perception of their ability to perform an action. Entrepreneurial Self-Efficacy is a specific form of perceived behavioral control

in the context of entrepreneurship. The results of this study indicate that digital literacy is not yet able to shape students' perceived behavioral control. The ability to use technology only provides technical skills. Thus, students with high digital literacy do not necessarily feel confident in being able to run a business if they do not have adequate entrepreneurial experience and competency. These findings provide a theoretical contribution by demonstrating that, in the context of vocational high school students, digital literacy does not automatically increase entrepreneurial self-efficacy. These research findings extend the application of the Theory of Planned Behavior by demonstrating that mastery of digital skills is not sufficient to establish perceived behavioral control in an entrepreneurial context. Therefore, developing entrepreneurial self-efficacy requires not only digital skills but also relevant experience in applying those skills to entrepreneurial activities.

The Effect of Entrepreneurship Education on Digital Entrepreneurial Intention, with Entrepreneurial Self-Efficacy as a Mediating Variable

The results of the study indicate that entrepreneurship education has a positive and significant effect on digital entrepreneurial intention through the mediation of entrepreneurial self-efficacy. This finding suggests that entrepreneurship education does not directly increase digital entrepreneurial intention, but rather first increases students' confidence in their own entrepreneurial abilities. When students believe they are capable of running a digital business, their intention to become digital entrepreneurs is strengthened.

This study is consistent with the research by Hafid et al (2024), which shows that self-efficacy plays a significant mediating role between entrepreneurship education and the intention to engage in digital entrepreneurship: the better the entrepreneurship education received by students, the greater their self-efficacy, and ultimately the stronger their intention to engage in digital entrepreneurship. The entrepreneurship learning process is not merely about imparting knowledge; it must also create experiences that build students' self-confidence through business practice, project-based learning, business simulations and entrepreneurial mentoring. Furthermore, research by Ganefri et al. (2024) indicates that entrepreneurship education has a positive and significant effect on digital entrepreneurial intention through the mediating role of entrepreneurial self-efficacy.

Based on the Theory of Planned Behavior (TPB), entrepreneurship education plays a role in shaping perceived behavioral control and attitudes toward behavior, which ultimately influence digital entrepreneurial intentions. However, this study found that entrepreneurship education was not able to shape both directly, thus not resulting in an increase in digital entrepreneurial intention. Changes in perceived behavioral control and attitudes toward behavior are only formed when students have high entrepreneurial self-efficacy, which is reflected in the confidence to start a digital business, the ability to solve various problems, and the readiness to face the risks of digital entrepreneurship. Thus, entrepreneurial self-efficacy plays a role as a psychological factor that can transform entrepreneurial knowledge into behavioral intentions.

This finding provides a theoretical contribution by showing that the influence of entrepreneurship education on digital entrepreneurial intention in vocational high school students does not occur directly, but rather through increased entrepreneurial self-efficacy. The results of this study expand the application of the Theory of Planned Behavior in the context of digital entrepreneurship by showing that entrepreneurship education will be more effective in increasing digital entrepreneurial intention if it is able to build students' confidence in their ability to run a digital-based business.

The Effect of Digital Literacy on Digital Entrepreneurial Intention, with Entrepreneurial Self-Efficacy as a Mediating Variable

The results of the study indicate that entrepreneurial self-efficacy is unable to mediate the influence of digital literacy on digital entrepreneurial intention. This study shows that students' digital literacy plays a greater role in helping them recognize business opportunities, utilize digital technology, and understand the potential of digital businesses, but it is not enough to form the belief that they have the ability to start, manage, and develop digital-based businesses.

These findings are also supported by the results of objective digital literacy tests, which indicate that some students still experience difficulties in understanding the application of digital literacy in an entrepreneurial context, such as maintaining customer data security, addressing digital security threats, and creating digital content that supports business activities. This condition indicates that students' digital literacy is still focused on mastering technology, but has not yet fully developed the confidence to utilize these skills to run a digital-based business. Therefore, digital literacy can directly increase digital entrepreneurial intention, but it is not able to increase entrepreneurial self-efficacy, so the mediation pathway is not formed.

Based on the Theory of Planned Behavior (TPB) proposed by Ajzen, a person's intention to perform a behavior is influenced by attitude, subjective norm, and perceived behavioral control. In this study, entrepreneurial self-efficacy represents perceived behavioral control, namely students' confidence in their ability to run a digital business. This shows that the formation of entrepreneurial self-efficacy requires not only technological mastery but also practical experience, success in completing entrepreneurial activities, mentoring, and opportunities to apply digital skills in real business contexts. As shown in the results of previous interviews, the development of students' digital skills in schools is still limited, so that digital skills are developed more through independent learning. This condition causes students' digital skills to not form perceived behavioral control. Therefore, digital literacy has not been able to increase entrepreneurial self-efficacy, so the mediation pathway is not formed.

These findings provide a theoretical contribution by demonstrating that the relationship between digital literacy and digital entrepreneurial intention in vocational high school students is more direct than through the mediation mechanism of entrepreneurial self-efficacy. These findings indicate that mastery of digital literacy alone is not sufficient to shape students' confidence in their digital entrepreneurial abilities. Therefore, developing entrepreneurial self-efficacy requires the support of learning experiences that connect digital skills with their application in digital entrepreneurial activities.

CONCLUSIONS

The findings of this study indicate that digital literacy and entrepreneurial self-efficacy have a positive and significant effect on digital entrepreneurial intention amongst students at state vocational schools in Madura. Conversely, entrepreneurship education does not have a direct effect on digital entrepreneurial intention, but it does have a positive effect on entrepreneurial self-efficacy. The research findings also demonstrate that entrepreneurial self-efficacy mediates the effect of entrepreneurship education on digital entrepreneurial intention, but does not mediate the effect of digital literacy on digital entrepreneurial intention.

These findings indicate that increasing students' intention to engage in digital entrepreneurship cannot be achieved solely through the provision of entrepreneurship education; it also requires strengthening students' confidence in their own ability to run a digital business. On the other hand, digital literacy is a factor that directly drives the formation of digital

entrepreneurial intention, as the ability to utilise digital technology enables students to be better prepared to recognise opportunities, develop business ideas, and utilise various digital platforms as a means of entrepreneurship. Therefore, entrepreneurship education in vocational schools needs to be integrated with the strengthening of digital competencies and learning strategies capable of enhancing students' entrepreneurial self-efficacy in order to be more effective in fostering digital entrepreneurial intention.

Further research is recommended to develop the research model by incorporating other relevant variables, such as entrepreneurial mindset, digital entrepreneurial attitude, perceived behavioural control, or innovation capability, so that the mechanisms underlying the formation of digital entrepreneurial intention can be explained more comprehensively. Furthermore, the research could be extended to different levels of education and geographical areas to obtain more representative results and enhance the generalisability of the findings.

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