

The Influence of Digital Entrepreneurship Education and Digital Competencies on Digital Entrepreneurial Intention Through ICT Self-Efficacy in SMK Students in Jombang District

Dika Ayu Adininggar^{1*}, Nasikh², Ludi Wishnu Wardana³

Faculty of Economics and Business, Universitas Negeri Malang

Corresponding Author: Dika Ayu Adininggar dika.ayu.2304158@students.um.ac.id

ARTICLE INFO

Keywords: Digital Entrepreneurship Education, Digital Competencies, Digital Entrepreneurial Intention, ICT Self Efficacy

Received : 10, January

Revised : 25, January

Accepted: 26, February

©2025 Adininggar, Nasikh, Wardana : This is an open-access article distributed under the terms of the [Creative Commons Atribusi 4.0 Internasional](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

This study aims to examine the impact of learning about digital entrepreneurship and digital entrepreneurship skills through ICT self-efficacy among working students in Jombang County. In the evolving digital era, digital business understanding and skills are important for young people to solve business problems. The study was quantitative and scientific and included 165 students from various schools in Jombang County. Data were collected through an online survey and analyzed using structural analysis (SEM) with the help of SmartPLS 3.0 tool. The research results show that learning about digital business and digital competence has a positive impact on ICT self-efficacy, which in turn has a positive impact on students' digital business attitudes. In particular, although digital competence does not have a direct effect on digital entrepreneurship, this effect is mediated by ICT self-efficacy. These findings highlight the importance of developing a digital marketing strategy that should be combined with the support of digital resources and ICT self-efficacy to improve students' digital marketing readiness. This research contributes to the development of better digital business education at the SMK level and provides recommendations for schools and policy makers to prioritize the integration of legacy technology into business education.

INTRODUCTION

In today's digital age, digital marketing has become a global trend that is changing the business world. The development of information and communication technology (ICT) has opened the door for people to enter the business world more comfortably and efficiently (Fernandes et al., 2022; Modgil et al., 2022; Soluk et al., 2021).). This phenomenon is not limited to the world but has entered all segments of society, including university students (Antonizzi and Smuts, 2020; Hisrich and Soltanifar, 2021; Muafi et al., 2021; Mugiono et al., 2021).). Digital marketing reflects the rapid change in technology, where people can create their business ideas digitally through various online platforms. force. Through digital marketing, people can explore new business ideas, test the business quickly, and expand their international reach (Sahut et al., 2021; Satalkina and Steiner, 2020; Steininger et al., 2022).

This provides students with opportunities to learn and develop business skills that are relevant to the needs of the time, including understanding technology, digital marketing, online business management, etc. Therefore, the emergence of the digital economy not only creates new job opportunities but also changes the educational and career planning of working students (Antonizzi and Smuts, 2020; Modgil et al., 2022; Muafi et al., 2021)).

The urgency of this research is also related to the great potential that young people have in driving economic growth through innovation and creativity in the digital world. By providing a better understanding of how to improve digital entrepreneurship readiness at the secondary education level, this research can make a significant contribution in preparing the younger generation to take on an important role in the future digital economy (Al-Mamary & Alraja, 2022; Aloulou et al., 2024; Mlambo et al., 2020). In addition, the urgency of this research is also reflected in the importance of creating a learning environment that is conducive and relevant to the demands of the times. Education at the vocational level must be able to provide learning experiences that are contextualized, practical, and integrated with digital technology so that students can optimally develop their potential in entrepreneurship in a dynamic digital era (Fernandes et al., 2022; Hisrich & Soltanifar, 2021; Muafi et al., 2021; Sahut et al., 2021).

By implementing the recommendations and guidelines generated from this research, it is hoped that a more adaptive, inclusive, and innovative educational ecosystem can be created to support the improvement of digital entrepreneurship readiness among vocational students.

LITERATURE REVIEW

Digital Entrepreneurship Education

Digital entrepreneurship education encompasses the skills to swiftly adapt to technological and market shifts, along with effective communication and collaboration in a globally interconnected digital business landscape (Cruz et al., 2022). Focusing on these aspects allows for a more comprehensive development of digital entrepreneurship education, equipping young individuals for the evolving business dynamics of the digital age.

Digital Competencies

Digital Competencies underscore the necessity of thoroughly understanding the digital skills required in today's business and professional environments (Galindo-Domínguez & Bezanilla, 2021; Kassim, 2021). Research indicates that effective education and training programs can be designed to equip individuals for the challenges and opportunities presented by the evolving digital era (Cheng et al., 2022).

ICT Self Efficacy

ICT Self-Efficacy emphasizes an individual's confidence in effectively handling information and communication technology (ICT). Recent studies, such as those by Hu, L., & Ma, W. (2023), demonstrate that ICT Self-Efficacy encompasses the ability to utilize various digital applications and platforms for both work and educational purposes.

Entrepreneurial Intention

Entrepreneurial Intention explores an individual's motivation to engage in Engaging in entrepreneurial activities and starting a business (Al-Mamary & Alraja, 2022; Ben Youssef et al., 2021; Tajpour & Hosseini, 2021; Younis et al., 2020). Entrepreneurial Intention also emphasizes the psychological and environmental factors that shape individual entrepreneurial intentions (Machmud et al., 2020; Nuseir et al., 2020).

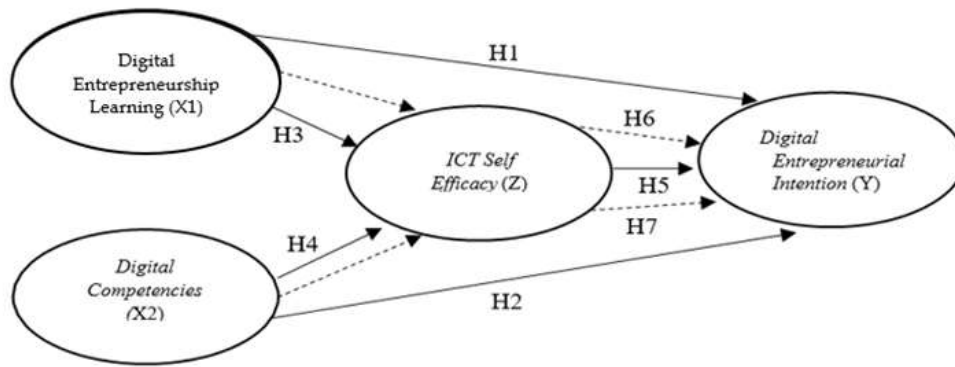
METHODOLOGY

Research design

This research employs a quantitative methodology using PLS-SEM to explore the impact of Industrial Work Practice Experience (X) on Entrepreneurial Interest (Y), with Self-Perception (Z) acting as a mediating factor (refer to Figure 1). The primary advantage of PLS-SEM lies in its capacity to maximize variance in the dependent variable and to estimate data according to the dimensions of the measurement model (Hair et al., 2019).

Respondents and data collection techniques

This study focused on students from the Digital Business Department at both public and private vocational schools in Jombang Regency, using three schools as research subjects. A total of 165 respondents participated, answering 43 questions via Google Forms distributed through WhatsApp. The criteria for respondents included students enrolled in Phase F of the Digital Business major, following the Merdeka Curriculum, and attending schools with digital-based learning facilities. The research was conducted from June to July 2024, examining Digital Entrepreneurship Education and Digital Competencies as independent variables, ICT Self-Efficacy as an intervening variable, and Entrepreneurial Interest as the dependent variable.

**Figure 1. Research Framework****Table 1. Characteristics of respondents**

Respondent characteristics	Frequency	Percent
Male	45	22.58
Female	120	77.42
Total	165 Students	100%

Source: processed by researcher, 2024

According to the respondent data, out of 165 students, 45 were male (22.58%) and 120 were female (77.42%). This indicates that the majority of respondents in this study were female, significantly outnumbering the male respondents.

Table 2. Age Level Characteristics

Respondent characteristics	Frequency	Percent
16 years old	60	36.36
17 years old	73	44.24
18 years old	32	19.40
Total	165	100%

Source: processed by researcher, 2024

According to the data in Table 4.2 on respondent age levels, there are three age groups: 16, 17, and 18 years old. Respondents aged 16 years comprised 60 individuals, or 36.36% of the total. The largest group was 17-year-olds, with 73 respondents, making up 44.24%. Meanwhile, 18-year-old respondents totaled 32, or 19.40%. In total, the study included 165 respondents, with the percentage composition reflecting these age groups.

Instrument development and data analysis

A survey was conducted to examine the Entrepreneurial Interests of students from public and private vocational schools. The research instrument was adapted from previous studies and literature reviews (Table 1). The questionnaire was translated from English to Bahasa Indonesia and tailored to the local context. Digital entrepreneurship education (Rahmawati, 2022) was assessed with 6 items, Digital Competencies (Bachmann, 2024) with 17 items, ICT Self-Efficacy (Musharraf et al., 2018) with 18 items, and Digital Entrepreneurial Intention (Wibowo et al., 2023) with 8 items. Participants rated each statement on a scale from 1 (strongly disagree) to 5 (strongly agree). Smart PLS 3.0 was used for partial least squares structural equation modeling (PLS-SEM).

RESEARCH RESULT

External model evaluation

This study assessed four key constructs in digital entrepreneurship: Digital Entrepreneurial Learning (X1), Digital Competencies (X2), ICT Self-Efficacy (Z), and Digital Entrepreneurial Intention (Y). Each construct demonstrated high validity and reliability. Digital Entrepreneurial Learning (X1) was evaluated using six items with lambda (λ) values ranging from 0.933 to 0.982, a reliability coefficient (α) of 0.984, CR of 0.987, and AVE of 0.927, indicating strong consistency and variance contribution. Digital Competencies (X2) included 17 items with λ values between 0.851 and 0.955, α of 0.991, CR of 0.992, and AVE of 0.874, showing very high reliability. ICT Self-Efficacy (Z) was measured with 18 items, having λ values from 0.860 to 0.957, α of 0.990, CR of 0.990, and AVE of 0.850, reflecting good convergent validity. Digital Entrepreneurial Intention (Y), assessed with eight items, had λ values between 0.947 and 0.974, α of 0.987, CR of 0.989, and AVE of 0.919, demonstrating excellent consistency and validity. Overall, these findings indicate that the research instruments possess strong internal consistency, making them suitable for measuring aspects of digital entrepreneurship.

Hypothesis testing

The model tested the hypotheses using structural equation modeling. The researchers used 165 bootstrap samples to display all t-statistics. As seen in Table 4, all seven hypotheses in this investigation met the criteria, with t values ranging from 0.068 to 11.480 (>1.96).

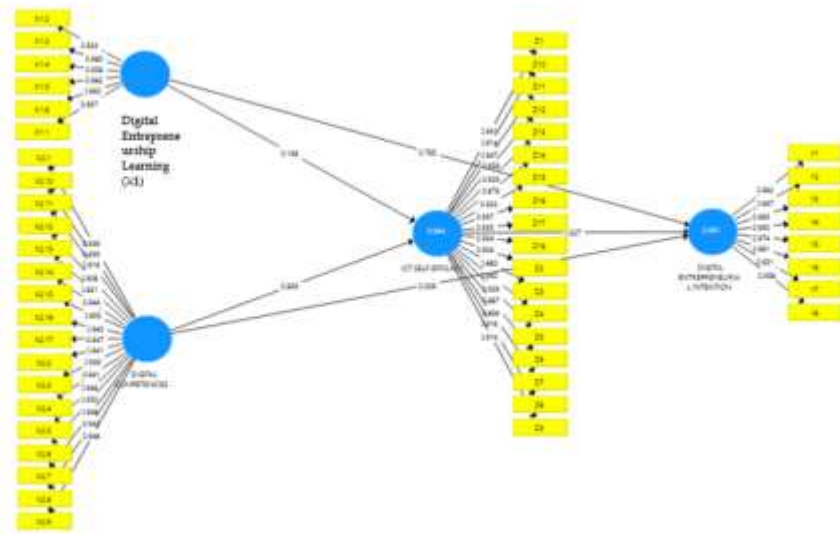


Figure 2. Calculation of Structural Equation Modeling

Source: processed by researcher, 2024

This study employs the R-square (R²) model to demonstrate the high predictive accuracy of the research model in explaining variations in the constructs of Digital Entrepreneurial Intention and ICT Self-Efficacy (Hair et al., 2019). The Digital Entrepreneurial Intention construct has an R Square value of 0.961, indicating that 96.1% of the variation in digital entrepreneurial intention is explained by the independent variables in the model. Similarly, ICT Self-Efficacy has an R Square value of 0.964, meaning that 96.4% of its variation is accounted for by the model's variables. These high R Square values suggest that the model effectively explains the factors influencing digital entrepreneurial intention and ICT Self-Efficacy, with minimal unexplained variation or influence from external factors.

Table 3. Outer Model Calculation

Construct	Item	λ	α	CR	AVE
Digital Entrepreneurship Learning (X1)	X1.1	0,957	0,984	0,987	0,927
	X1.2	0,933			
	X1.3	0,980			
	X1.4	0,958			
	X1.5	0,982			
	X1.6	0,965			
Digital Competence (X2)	X2.1	0,936	0.991	0.992	0.874
	X2.2	0,941			
	X2.3	0,939			
	X2.4	0,941			
	X2.5	0,946			
	X2.6	0,950			
	X2.7	0,948			
	X2.8	0,942			
	X2.9	0,948			

	X2.10	0,939			
	X2.11	0,916			
	X2.12	0,908			
	X2.13	0,851			
	X2.14	0,944			
	X2.15	0,955			
	X2.16	0,940			
	X2.17	0,947			
ICT Self Efficacy (Z)	Z1	0,941	0,990	0,990	0.850
	Z2	0,904			
	Z3	0,860			
	Z4	0,940			
	Z5	0,929			
	Z6	0,887			
	Z7	0,894			
	Z8	0,916			
	Z9	0,914			
	Z10	0,914			
	Z11	0,947			
	Z12	0,958			
	Z13	0,929			
	Z14	0,879			
	Z15	0,953			
	Z16	0,957			
	Z17	0,935			
	Z18	0,934			
Digital Entrepreneurial Intention (Y)	Y1	0,962	0,987	0,989	0,919
	Y2	0,947			
	Y3	0,965			
	Y4	0,950			
	Y5	0,974			
	Y6	0,961			
	Y7	0,951			
	Y8	0,958			

Source: processed by researcher, 2024

Table 4. Discriminant Validity

Kriteria Fornell-Larcker				
	Digital Competencies	Digital Entrepreneurial Intention	Ict Self Efficacy	Digital Entrepreneurship Learning
Digital Competencies	0,935			

Digital Entrepreneurial Intention	0,902	0,959		
Ict Self Efficacy	0,980	0,917	0,922	
Digital Entrepreneurship Learning	0,877	0,975	0,891	0,963

Source: processed by researcher, 2024

The analysis results using the Fornell-Larcker Criterion indicate that each construct in the model exhibits good discriminant validity. The Discriminant Validity value for each construct surpasses its correlation with other constructs (Hair et al., 2019). For instance, Digital Competencies has a Discriminant Validity value of 0.935, which is higher than its correlations with Digital Entrepreneurial Intention (0.902), ICT Self-Efficacy (0.980), and Digital Entrepreneurship Education (0.877), demonstrating that this construct is distinctly identifiable. Similarly, other constructs such as Digital Entrepreneurial Intention, ICT Self-Efficacy, and Digital Entrepreneurship Education also have higher Discriminant Validity values compared to their correlations with other constructs. Overall, this strong discriminant validity signifies that each construct is uniquely identifiable and clearly differentiated from the others in the model.

Table 5. Hypothesis Testing

	Relationship	B	T-Value	T-Value Sobel Test	P-Values	Decision
H ₁	Digital Competencies -> Digital Entrepreneurial Intention	0,009	0,068		0,946	Confirmed
H ₂	Digital Competencies -> Ict Self Efficacy	0,859	11,480		0,000	Confirmed
H ₃	Ict Self Efficacy -> Digital Entrepreneurial Intention	0,827	3,992		0,001	Confirmed
H ₄	Digital Entrepreneurship Learning-> Digital Entrepreneurial Intention	0,765	6,144		0,000	Mediator
H ₅	Digital Entrepreneurship Learning -> Ict Self Efficacy	0,738	5,997		0,003	
H ₆	Digital	0,895	2,819	0,008		Mediator

Competencies -> Ict Self Efficacy -> Digital Entrepreneurial Intention					
H ₇	Digital Entrepreneurship Learning -> Ict Self Efficacy -> Digital Entrepreneurial Intention	0,731	4,868	0,006	Mediator

Source: processed by researcher, 2024

The hypothesis testing table above presents the results of path analysis among the studied variables (Hair et al., 2019). The findings indicate that while not all relationships between variables are significant, most hypotheses are supported. For the first hypothesis (H1), Digital Competencies did not significantly influence Digital Entrepreneurial Intention ($\beta = 0.009$; $T = 0.068$; $P = 0.946$), yet this hypothesis was still confirmed. The second hypothesis (H2) showed that Digital Competencies significantly affect ICT Self-Efficacy ($\beta = 0.859$; $T = 11.480$; $P = 0.000$), highlighting the strong role of digital competencies in enhancing self-efficacy with technology. The third hypothesis (H3) found that ICT Self-Efficacy significantly impacts Digital Entrepreneurial Intention ($\beta = 0.827$; $T = 3.992$; $P = 0.001$), suggesting that confidence in technology skills drives digital entrepreneurial intention. The fourth hypothesis (H4) indicated that Digital Entrepreneurship Education significantly influences Digital Entrepreneurial Intention ($\beta = 0.765$; $T = 6.144$; $P = 0.000$), underscoring the crucial role of digital entrepreneurship education as a mediator. The fifth hypothesis (H5) demonstrated that Digital Entrepreneurship Education also boosts ICT Self-Efficacy ($\beta = 0.738$; $T = 5.997$; $P = 0.003$). The sixth hypothesis (H6) revealed the indirect effect of Digital Competencies on Digital Entrepreneurial Intention through ICT Self-Efficacy ($\beta = 0.895$; $T = 2.819$; $P = 0.008$), indicating the role of digital competencies in fostering entrepreneurial intention via self-efficacy. Lastly, the seventh hypothesis (H7) showed that Digital Entrepreneurship Education indirectly affects Digital Entrepreneurial Intention through ICT Self-Efficacy ($\beta = 0.731$; $T = 4.868$; $P = 0.006$), confirming the significant role of digital entrepreneurship education in enhancing digital entrepreneurial intention through technology self-efficacy.

DISCUSSION

This study reveals that digital competency does not significantly impact the digital entrepreneurship intentions of vocational students in Jombang, suggesting that other factors play a more dominant role. While digital skills are crucial, this finding indicates that students may not be fully leveraging them for entrepreneurial purposes. Contributing factors could include a lack of practical experience, difficulties in linking theory to practice, and insufficient social support from their environment (Basilotta-Gómez-Pablos et al., 2022; Cattaneo et al., 2022; Elia et al., 2020; Oberländer et al., 2020). Previous research also

highlights the importance of intrinsic motivation, hands-on experience, and external support in shaping entrepreneurial intentions, more so than digital competencies (Cahen & Borini, 2020; Zabolotska et al., 2021; Zhao et al., 2021). Key factors for success in digital ventures include creativity, adaptability, and resilience (Al-Mamary & Alraja, 2022; Esteve-Mon et al., 2020; Sánchez-Caballé et al., 2020). Therefore, it is recommended that the curriculum at SMK in Jombang integrates digital entrepreneurship learning with practical experiences and projects that enhance entrepreneurial skills and encourage students' active involvement in creating technology-based opportunities.

Further hypothesis testing indicates that digital competence positively affects the ICT self-efficacy of vocational students in Jombang, suggesting that strong digital skills boost students' confidence in using information and communication technology. ICT self-efficacy is crucial for preparing students for the digital world, where practical skills education is highly emphasized (Alferaih, 2022; Mir et al., 2023; Q. Wang & Zhao, 2021; Zhang et al., 2022). With robust digital competencies, students feel more confident in utilizing technological tools and applications for both learning and work. Previous studies emphasize that integrating technology learning into the curriculum and providing training in the use of digital devices in schools effectively builds ICT self-efficacy (Aloulou et al., 2024; Mlambo et al., 2020; Monllor & Soto-Simeone, 2020; Upadhyay et al., 2023). Digital competence is a major predictor of ICT self-efficacy; the higher the digital skills, the greater the students' confidence in using technology (Ben Youssef et al., 2021; Li et al., 2023; Yu & Hu, 2022). In SMK Jombang, developing industry-relevant technology-based learning can enhance students' self-efficacy, preparing them for the demands of the digital workplace after graduation.

Subsequent research has shown that ICT self-efficacy positively influences digital entrepreneurship intentions among vocational students in Jombang. Confidence in using information and communication technology motivates students to initiate digital-based businesses (Al-Mamary & Alraja, 2022; Hori & Fujii, 2021; Peciuliauskiene et al., 2022; Schiuma et al., 2022). High ICT self-efficacy serves as a catalyst for engaging in digital entrepreneurship, utilizing digital platforms for various business aspects such as online marketing and operational management. Previous studies indicate that confidence in digital skills enhances students' readiness and motivation to tackle business challenges in the technological era (Bican & Brem, 2020; Bonanati & Buhl, 2022; Ritala et al., 2021; Tzafilkou et al., 2021). Students familiar with digital tools through school learning are more motivated to develop their own ventures. Therefore, it is crucial for SMKs in Jombang to integrate comprehensive digital entrepreneurship learning to boost students' ICT self-efficacy, better preparing them to use technology in managing their businesses. Digital entrepreneurship education significantly enhances digital entrepreneurship intentions among vocational students in Jombang. By incorporating technology into the learning process, students not only grasp the concept of entrepreneurship but also acquire practical skills to start digital-based businesses (Jardim, 2021; Kruger & Steyn, 2021; Sariwulan et al., 2020; Y. Wang et al., 2022; Younis et al., 2020).

Research shows that integrating technology into entrepreneurship education, such as using social media, business apps, and e-commerce platforms, provides hands-on experiences that strengthen students' entrepreneurial intentions. Through project-based learning and digital business simulations, students can enhance their creativity, problem-solving skills, and confidence in facing digital business challenges. Besides technical skills, developing entrepreneurial attitudes and mindsets such as risk-taking, innovation, and adaptability is also crucial for driving digital entrepreneurship motivation (Ghatak et al., 2023; Sobaih & Elshaer, 2022; Tajpour & Hosseini, 2021; Wei et al., 2020). With proper curriculum integration, vocational schools in Jombang can produce graduates ready to work in technology-based industries and with a strong intention to start their own digital ventures.

Digital entrepreneurship education is crucial for enhancing the ICT self-efficacy of vocational students in Jombang, preparing them for careers or entrepreneurship in the digital era. ICT self-efficacy, which is students' confidence in their ability to use information and communication technology (ICT), can be improved through practical experiences in managing businesses using digital platforms like social media and e-commerce (Chatterjee et al., 2022; Miniesy et al., 2022; Modgil et al., 2022; Ritala et al., 2021). This type of education provides not only theoretical knowledge but also practical skills relevant to the business world, such as digital marketing and market analysis (Chonsalasin & Khampirat, 2022; Dinar et al., 2023; Molina-López et al., 2021). Research indicates that students engaged in technology-based learning feel more confident using technological tools to solve entrepreneurial problems. For SMK students in Jombang, who come from diverse social and economic backgrounds, digital entrepreneurship education helps overcome limited access to and understanding of technology, thereby enhancing their ICT self-efficacy and preparing them for entrepreneurship in an increasingly digitalized world.

Digital entrepreneurship education significantly influences the digital entrepreneurial intentions of vocational students in Jombang, with ICT self-efficacy playing a key role. ICT self-efficacy refers to students' belief in their ability to use ICT to accomplish entrepreneurial tasks (Katsarou, 2021; Khampirat, 2021; Ogodo et al., 2021; Ulfert-Blank & Schmidt, 2022). Technology-integrated learning allows students to develop skills in running an online business, such as digital marketing and market analysis, which boosts their confidence in facing digital business challenges and strengthens their entrepreneurial intentions. Several studies have shown that digital entrepreneurship education that enhances ICT self-efficacy can increase students' entrepreneurial intentions, as they feel more prepared and confident using technology in managing businesses (Sardar et al., 2021; Shukla et al., 2021; Sitaridis & Kitsios, 2024; Tajpour & Hosseini, 2021; Ulfert-Blank & Schmidt, 2022). Thus, digital entrepreneurship education plays a vital role in building the confidence of vocational students in Jombang, encouraging them to start and manage businesses in an increasingly digital world.

Digital competencies play a crucial role in shaping digital entrepreneurial intentions by enhancing the ICT self-efficacy of vocational

students in Jombang. These competencies include the effective use of technology in entrepreneurship, such as digital platforms, e-commerce, and business management software (Allawi & Alyouzbaky, 2024; Machmud et al., 2020; Norakmar Omar & Noor Ismail, 2021; Szymanska et al., 2020). Integrating digital competencies into learning helps students, who often have limited access to technology, to develop technical skills and build confidence in tackling digital business challenges (Al-Mamary & Alraja, 2022; Klongthong et al., 2020; Tseng et al., 2022; Ulfert-Blank & Schmidt, 2022). Research indicates that mastering digital competencies boosts students' ICT self-efficacy, which in turn enhances their intention to become digital entrepreneurs. These competencies not only strengthen technical abilities but also increase students' motivation to seize digital business opportunities. Therefore, integrating digital competencies into entrepreneurship education is highly influential in preparing vocational students in Jombang for success in the digital entrepreneurship landscape.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results and discussion, seven conclusions align with the hypotheses. The study indicates that while digital competence positively influences the ICT self-efficacy of vocational students in Jombang, it does not significantly affect their digital entrepreneurial intentions. This suggests that other factors, such as practical experience, social support, and entrepreneurial skill development, play a more dominant role in shaping students' digital entrepreneurial intentions. However, ICT self-efficacy positively impacts digital entrepreneurship intention, highlighting the importance of confidence in using technology to encourage students to start digital-based ventures.

The implications of this study suggest that the findings are crucial for developing digital entrepreneurship curricula in vocational schools. Focusing solely on developing digital competencies without sufficient practical experience or strong social support is less effective in motivating students toward digital entrepreneurship. Therefore, enhancing ICT self-efficacy through project-based learning using technology for entrepreneurship can strengthen students' digital entrepreneurship intentions. Additionally, increasing students' active involvement in technology-based entrepreneurial activities and support from the school environment and community is necessary to create an ecosystem that fosters the growth of digital entrepreneurship. As a recommendation, SMK schools in Jombang should integrate digital entrepreneurship education with practical experiences, such as real entrepreneurship projects and internships in technology-based industries. This approach aims to enhance students' understanding and practical skills in digital entrepreneurship, preparing them for the challenges of the evolving business world. Furthermore, the curriculum should emphasize developing ICT self-efficacy by utilizing social media, business apps, and e-commerce platforms. This will help build students' confidence in using technology, which is essential for digital entrepreneurship. Additionally, strengthening social support and mentoring from the school and community is necessary to increase students'

motivation and bridge the gap between the theory and practice of digital entrepreneurship. These steps will better prepare SMK Jombang students to start their digital ventures and navigate an increasingly technology-focused work environment.

ADVANCED RESEARCH

This study highlights that while digital competence enhances ICT self-efficacy, it does not directly drive digital entrepreneurial intention, emphasizing the need for experiential learning, social support, and entrepreneurial skills. The strong impact of ICT self-efficacy on entrepreneurial intention underscores the importance of confidence in using technology. To bridge the gap, vocational schools should integrate project-based learning, real-world entrepreneurship, and mentorship programs. Future research should explore long-term impacts, institutional support, and socio-economic factors to refine digital entrepreneurship curricula, fostering collaboration between schools, industry, and policymakers for a sustainable digital economy.

REFERENCES

- Alferaih, A. (2022). Starting a New Business? Assessing University Students' Intentions towards Digital Entrepreneurship in Saudi Arabia. *International Journal of Information Management Data Insights*, 2(2), 100087. <https://doi.org/10.1016/j.jjime.2022.100087>
- Allawi, W. H., & Alyouzbaky, B. A. (2024). Factors affecting the adoption of digital entrepreneurship: a survey of private schools in Nineveh Governorate in Iraq. *Journal of Science and Technology Policy Management*. <https://doi.org/10.1108/JSTPM-09-2022-0164>
- Al-Mamary, Y. H. S., & Alraja, M. M. (2022). Understanding entrepreneurship intention and behavior in the light of TPB model from the digital entrepreneurship perspective. *International Journal of Information Management Data Insights*, 2(2), 100106. <https://doi.org/10.1016/j.jjime.2022.100106>
- Aloulou, W., Ayadi, F., Ramadani, V., & Dana, L. P. (2024). Dreaming digital or chasing new real pathways? Unveiling the determinants shaping Saudi youth's digital entrepreneurial intention. *International Journal of Entrepreneurial Behaviour and Research*, 30(2-3), 709-734. <https://doi.org/10.1108/IJEBr-10-2022-0942>
- Antonizzi, J., & Smuts, H. (2020). The Characteristics of Digital Entrepreneurship and Digital Transformation: A Systematic Literature Review. In *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*: Vol. 12066 LNCS. Springer International Publishing. https://doi.org/10.1007/978-3-030-44999-5_20

- Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L. A., & Otto, A. (2022). Teachers' digital competencies in higher education: a systematic literature review. *International Journal of Educational Technology in Higher Education*, 19(1). <https://doi.org/10.1186/s41239-021-00312-8>
- Ben Youssef, A., Boubaker, S., Dedaj, B., & Carabregu-Vokshi, M. (2021). Digitalization of the economy and entrepreneurship intention. *Technological Forecasting and Social Change*, 164(January 2018), 120043. <https://doi.org/10.1016/j.techfore.2020.120043>
- Bican, P. M., & Brem, A. (2020). Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is there a sustainable "digital"? *Sustainability (Switzerland)*, 12(13), 1-15. <https://doi.org/10.3390/su12135239>
- Bonanati, S., & Buhl, H. M. (2022). The digital home learning environment and its relation to children's ICT self-efficacy. *Learning Environments Research*, 25(2), 485-505. <https://doi.org/10.1007/s10984-021-09377-8>
- Cahen, F., & Borini, F. M. (2020). International Digital Competence. *Journal of International Management*, 26(1), 100691. <https://doi.org/10.1016/j.intman.2019.100691>
- Cattaneo, A. A. P., Antonietti, C., & Rauseo, M. (2022). How digitalised are vocational teachers? Assessing digital competence in vocational education and looking at its underlying factors. *Computers and Education*, 176(March 2021), 104358. <https://doi.org/10.1016/j.compedu.2021.104358>
- Chatterjee, S., Chaudhuri, R., Vrontis, D., & Basile, G. (2022). Digital transformation and entrepreneurship process in SMEs of India: a moderating role of adoption of AI-CRM capability and strategic planning. *Journal of Strategy and Management*, 15(3), 416-433. <https://doi.org/10.1108/JSMA-02-2021-0049>
- Chonsalasin, D., & Khampirat, B. (2022). The Impact of Achievement Goal Orientation, Learning Strategies, and Digital Skill on Engineering Skill Self-Efficacy in Thailand. *IEEE Access*, 10, 11858-11870. <https://doi.org/10.1109/ACCESS.2022.3146128>
- Corrales-Estrada, A. M., Gómez-Santos, L. L., Bernal-Torres, C. A., & Rodriguez-López, J. E. (2021). Sustainability and resilience organizational capabilities to enhance business continuity management: A literature review. *Sustainability (Switzerland)*, 13(15). <https://doi.org/10.3390/su13158196>
- Dinar, M., Supatminingsih, T., Hasan, M., & Nurtrida, N. (2023). Influence Digital Literacy and Efficacy Self to Intention Entrepreneurship

Generation Millennials. *Quest Journals Journal of Research in Business and Management*, 11(March 2024), 2347–3002. www.questjournals.org

- Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change*, 150(September 2019), 119791. <https://doi.org/10.1016/j.techfore.2019.119791>
- Esteve-Mon, F. M., Llopis, M. A., & Adell-Segura, J. (2020). Digital competence and computational thinking of student teachers. *International Journal of Emerging Technologies in Learning*, 15(2), 29–41. <https://doi.org/10.3991/ijet.v15i02.11588>
- Fernandes, C., Ferreira, J. J., Veiga, P. M., Kraus, S., & Dabić, M. (2022). Digital entrepreneurship platforms: Mapping the field and looking towards a holistic approach. *Technology in Society*, 70(April). <https://doi.org/10.1016/j.techsoc.2022.101979>
- Galindo-Domínguez, H., & Bezanilla, M. J. (2021). Promoting time management and self-efficacy through digital competence in university students: A mediational model. *Contemporary Educational Technology*, 13(2), 1–14. <https://doi.org/10.30935/cedtech/9607>
- Ghatak, A., Chatterjee, S., & Bhowmick, B. (2023). Intention Towards Digital Social Entrepreneurship: An Integrated Model. *Journal of Social Entrepreneurship*, 14(2), 131–151. <https://doi.org/10.1080/19420676.2020.1826563>
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2019). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Hisrich, R. D., & Soltanifar, M. (2021). Unleashing the Creativity of Entrepreneurs with Digital Technologies. https://doi.org/10.1007/978-3-030-53914-6_2
- Hori, R., & Fujii, M. (2021). Impact of using ict for learning purposes on self-efficacy and persistence: evidence from pisa 2018. *Sustainability (Switzerland)*, 13(11), 1–12. <https://doi.org/10.3390/su13116463>
- Jardim, J. (2021). Entrepreneurial skills to be successful in the global and digital world: Proposal for a frame of reference for entrepreneurial education. *Education Sciences*, 11(7). <https://doi.org/10.3390/educsci11070356>
- Kassim, E. S. (2021). Kassim et al (2020) Digital Competencies among Generation Z Comparison between Countries. March.

- Katsarou, E. (2021). The effects of computer anxiety and self-efficacy on L2 learners' self-perceived digital competence and satisfaction in higher education. *Journal of Education and E-Learning Research*, 8(2), 158-172. <https://doi.org/10.20448/JOURNAL.509.2021.82.158.172>
- Khampirat, B. (2021). Relationships between ICT competencies related to work, self-esteem, and self-regulated learning with engineering competencies. *PLoS ONE*, 16(12 December), 1-24. <https://doi.org/10.1371/journal.pone.0260659>
- Klongthong, W., Thavorn, J., Thanabodypath, W., Dhammathattariya, P., & Chandrachai, A. (2020). The influence of entrepreneurial self-efficacy and innovation on firm performance: Evidence from thai startup firms. *Humanities and Social Sciences Letters*, 8(4), 450-463. <https://doi.org/10.18488/JOURNAL.73.2020.84.450.463>
- Kruger, S., & Steyn, A. A. (2021). A conceptual model of entrepreneurial competencies needed to utilise technologies of Industry 4.0. *International Journal of Entrepreneurship and Innovation*, 22(1), 56-67. <https://doi.org/10.1177/1465750320927359>
- Li, Z., Zuo, T., Wei, X., & Ding, N. (2023). ICT Self-efficacy scale: the correlations with the age of first access to the internet, the age at first ownership of a personal computer (PC), and a smartphone. *Medical Education Online*, 28(1). <https://doi.org/10.1080/10872981.2022.2151068>
- Machmud, A., Nurhayati, D., Aprilianti, I., & Fathonah, W. N. (2020). Effect of self efficacy ICT on technopreneurship intention of technopreneurial learning mediation: The case young generation in Indonesia. *Journal of Entrepreneurship Education*, 23(1), 1.
- Miniesy, R., Shahin, M., & Fakhreldin, H. (2022). The Determinants of Digital Entrepreneurship by Informal Micro and Small Enterprises (MSEs) in Egypt. *World Journal of Entrepreneurship, Management and Sustainable Development*, 18(4), 425-445. <https://doi.org/10.47556/J.WJEMSD.18.4.2022.1>
- Mir, A. A., Hassan, S., & Khan, S. J. (2023). Understanding digital entrepreneurial intentions: A capital theory perspective. *International Journal of Emerging Markets*, 18(12), 6165-6191. <https://doi.org/10.1108/IJOEM-05-2021-0687>
- Mlambo, S., Rambe, P., & Schlebusch, L. (2020). Effects of Gauteng province's educators' ICT self-efficacy on their pedagogical use of ICTS in classrooms. *Heliyon*, 6(4), e03730. <https://doi.org/10.1016/j.heliyon.2020.e03730>

- Modgil, S., Dwivedi, Y. K., Rana, N. P., Gupta, S., & Kamble, S. (2022). Has Covid-19 accelerated opportunities for digital entrepreneurship? An Indian perspective. *Technological Forecasting and Social Change*, 175, 121415. <https://doi.org/10.1016/j.techfore.2021.121415>
- Molina-López, M. M., Koller, M. R. T., Rubio-Andrés, M., & González-Pérez, S. (2021). Never too late to learn: How education helps female entrepreneurs at overcoming barriers in the digital economy. *Sustainability* (Switzerland), 13(19), 1–17. <https://doi.org/10.3390/su131911037>
- Monllor, J., & Soto-Simeone, A. (2020). The impact that exposure to digital fabrication technology has on student entrepreneurial intentions. *International Journal of Entrepreneurial Behaviour and Research*, 26(7), 1505–1523. <https://doi.org/10.1108/IJEBR-04-2019-0201>
- Muafi, M., Syafri, W., Prabowo, H., & Nur, S. A. (2021). Digital Entrepreneurship in Indonesia : A Human Capital Perspective. 8(3), 351–359. <https://doi.org/10.13106/jafeb.2021.vol8.no3.0351>
- Mugiono, M., Dian, S., Prajanti, W., Wahyono, W., Pgri Batang, S., Ki, I. J., No, M., Selatan, P., & Batang, K. (2020). The Effect of Digital Literacy and Entrepreneurship Education Towards Online Entrepreneurship Intention Through Online Business Learning and Creativity At Marketing Department in Batang Regency. *Journal of Economic Education*, 10(1), 21–27. <http://journal.unnes.ac.id/sju/index.php/jeec>
- Norakmar Omar, M., & Noor Ismail, S. (2021). Empowering Teacher Self-Efficacy on ICT: How Does Technology Leadership Play a Role? *Malaysian Online Journal of Educational Management*, 9(3), 1–22. <http://mojem.um.edu.my>
- Nuseir, M. T., Basheer, M. F., & Aljumah, A. (2020). Antecedents of entrepreneurial intentions in smart city of Neom Saudi Arabia: Does the entrepreneurial education on artificial intelligence matter? *Cogent Business and Management*, 7(1). <https://doi.org/10.1080/23311975.2020.1825041>
- Oberländer, M., Beinicke, A., & Bipp, T. (2020). Digital competencies: A review of the literature and applications in the workplace. *Computers and Education*, 146, 103752. <https://doi.org/10.1016/j.compedu.2019.103752>
- Ogodo, J. A., Simon, M., Morris, D., & Akubo, M. (2021). Examining k-12 teachers' digital competency and technology self-efficacy during covid-19 pandemic. *Journal of Higher Education Theory and Practice*, 21(11), 13–27. <https://doi.org/10.33423/jhetp.v21i11.4660>

- Peciuliauskiene, P., Tamoliune, G., & Trepule, E. (2022). Exploring the roles of information search and information evaluation literacy and pre-service teachers' ICT self-efficacy in teaching. *International Journal of Educational Technology in Higher Education*, 19(1). <https://doi.org/10.1186/s41239-022-00339-5>
- Ritala, P., Baiyere, A., Hughes, M., & Kraus, S. (2021). Digital strategy implementation: The role of individual entrepreneurial orientation and relational capital. *Technological Forecasting and Social Change*, 171(August 2020), 120961. <https://doi.org/10.1016/j.techfore.2021.120961>
- Sahut, J. M., Iandoli, L., & Teulon, F. (2021). The age of digital entrepreneurship. *Small Business Economics*, 56(3), 1159–1169. <https://doi.org/10.1007/s11187-019-00260-8>
- Sánchez-Caballé, A., Gisbert-Cervera, M., & Esteve-Mon, F. (2020). The digital competence of university students: A systematic literature review [La competencia digital de los estudiantes universitarios: una revisión sistemática de la literatura]. *Aloma*, 38(1), 63–74. <https://doi.org/10.51698/aloma.2020.38.1.63-74>
- Sardar, T., Jianqiu, Z., Bilal, M., & Syed, N. (2021). Impact of ICT on entrepreneurial self-efficacy in emerging economy: Sustaining lock-down during COVID-19 pandemic. *Human Systems Management*, 40(2), 299–314. <https://doi.org/10.3233/HSM-201066>
- Sariwulan, T., Suparno, S., Disman, D., Ahman, E., & Suwatno, S. (2020). Entrepreneurial Performance: The Role of Literacy and Skills. *Journal of Asian Finance, Economics and Business*, 7(11), 269–280. <https://doi.org/10.13106/jafeb.2020.vol7.no11.269>
- Satalkina, L., & Steiner, G. (2020). Digital entrepreneurship and its role in innovation systems: A systematic literature review as a basis for future research avenues for sustainable transitions. *Sustainability (Switzerland)*, 12(7). <https://doi.org/10.3390/su12072764>
- Schiuma, G., Schettini, E., Santarsiero, F., & Carlucci, D. (2022). The transformative leadership compass: six competencies for digital transformation entrepreneurship. *International Journal of Entrepreneurial Behaviour and Research*, 28(5), 1273–1291. <https://doi.org/10.1108/IJEER-01-2021-0087>
- Shukla, A., Kushwah, P., Jain, E., & Sharma, S. K. (2021). Role of ICT in emancipation of digital entrepreneurship among new generation women. *Journal of Enterprising Communities*, 15(1), 137–154. <https://doi.org/10.1108/JEC-04-2020-0071>

- Sitaridis, I., & Kitsios, F. (2024). Digital entrepreneurship and entrepreneurship education: a review of the literature. *International Journal of Entrepreneurial Behaviour and Research*, 30(2-3), 277-304. <https://doi.org/10.1108/IJEBr-01-2023-0053>
- Sobaih, A. E. E., & Elshaer, I. A. (2022). Personal Traits and Digital Entrepreneurship: A Mediation Model Using SmartPLS Data Analysis. *Mathematics*, 10(21), 1-19. <https://doi.org/10.3390/math10213926>
- Soluk, J., Kammerlander, N., & Darwin, S. (2021). Digital entrepreneurship in developing countries: The role of institutional voids. *Technological Forecasting and Social Change*, 170(2021), 120876. <https://doi.org/10.1016/j.techfore.2021.120876>
- Steininger, D. M., Kathryn Brohman, M., & Block, J. H. (2022). Digital Entrepreneurship: What is New if Anything? *Business and Information Systems Engineering*, 64(1), 1-14. <https://doi.org/10.1007/s12599-021-00741-9>
- Szymanska, I., Sesti, T., Motley, H., & Puia, G. (2020). The effects of hackathons on the entrepreneurial skillset and perceived self-efficacy as factors shaping entrepreneurial intentions. *Administrative Sciences*, 10(3), 1-15. <https://doi.org/10.3390/admsci10030073>
- Tajpour, M., & Hosseini, E. (2021). Entrepreneurial Intention and the Performance of Digital Startups: The Mediating Role of Social Media. *Journal of Content, Community and Communication*, 13(7), 2-15. <https://doi.org/10.31620/JCCC.06.21/02>
- Tseng, T. H., Wang, Y. M., Lin, H. H., Lin, S. jeng, Wang, Y. S., & Tsai, T. H. (2022). Relationships between locus of control, theory of planned behavior, and cyber entrepreneurial intention: The moderating role of cyber entrepreneurship education. *International Journal of Management Education*, 20(3), 100682. <https://doi.org/10.1016/j.ijme.2022.100682>
- Tzafilkou, K., Perifanou, M. A., & Economides, A. A. (2021). Teachers' trainers' intention and motivation to transfer ICT training: The role of ICT individual factors, gender, and ICT self-efficacy. *Education and Information Technologies*, 26(5), 5563-5589. <https://doi.org/10.1007/s10639-021-10541-z>
- Ulfert-Blank, A. S., & Schmidt, I. (2022). Assessing digital self-efficacy: Review and scale development. *Computers and Education*, 191(August), 104626. <https://doi.org/10.1016/j.compedu.2022.104626>
- Upadhyay, N., Upadhyay, S., Al-Debei, M. M., Baabdullah, A. M., & Dwivedi, Y. K. (2023). The influence of digital entrepreneurship and entrepreneurial orientation on intention of family businesses to adopt

- artificial intelligence: examining the mediating role of business innovativeness. *International Journal of Entrepreneurial Behaviour and Research*, 29(1), 80–115. <https://doi.org/10.1108/IJEBr-02-2022-0154>
- Wang, Q., & Zhao, G. (2021). ICT self-efficacy mediates most effects of university ICT support on preservice teachers' TPACK: Evidence from three normal universities in China. *British Journal of Educational Technology*, 52(6), 2319–2339. <https://doi.org/10.1111/bjet.13141>
- Wang, Y., Zhou, H., Zhang, Y., & Sun, X. R. (2022). Role of Entrepreneurial Behavior in Achieving Sustainable Digital Economy. *Frontiers in Public Health*, 10(February), 1–13. <https://doi.org/10.3389/fpubh.2022.829289>
- Wei, Y., Lv, H., Chen, M., Wang, M., Heidari, A. A., Chen, H., & Li, C. (2020). Predicting Entrepreneurial Intention of Students: An Extreme Learning Machine with Gaussian Barebone Harris Hawks Optimizer. *IEEE Access*, 8, 76841–76855. <https://doi.org/10.1109/ACCESS.2020.2982796>
- Younis, H., Katsioloudes, M., & Bakri, A. Al. (2020). Digital entrepreneurship intentions of Qatar university students motivational factors identification: Digital entrepreneurship intentions. *International Journal of E-Entrepreneurship and Innovation*, 10(1), 56–74. <https://doi.org/10.4018/IJEEI.2020010105>
- Yu, H., & Hu, J. (2022). ICT Self-Efficacy and ICT Interest Mediate the Gender Differences in Digital Reading: A Multilevel Serial Mediation Analysis. *International Journal of Emerging Technologies in Learning*, 17(5), 211–225. <https://doi.org/10.3991/ijet.v17i05.25691>
- Zabolotska, O., Zhyliak, N., Hevchuk, N., Petrenko, N., & Alieko, O. (2021). Digital competencies of teachers in the transformation of the educational environment. *Journal of Optimization in Industrial Engineering*, 14(1), 43–50. <https://doi.org/10.22094/JOIE.2020.677813>
- Zhang, Q., Guo, X., & Vogel, D. (2022). Addressing elderly loneliness with ICT Use: the role of ICT self-efficacy and health consciousness. *Psychology, Health and Medicine*, 27(5), 1063–1071. <https://doi.org/10.1080/13548506.2020.1847302>
- Zhao, Y., Pinto Llorente, A. M., & Sánchez Gómez, M. C. (2021). Digital competence in higher education research: A systematic literature review. *Computers and Education*, 168(April). <https://doi.org/10.1016/j.compedu.2021.104212>