

When Entrepreneurial Interest is Not Enough: Digital Technology Utilization as a Mediator between Entrepreneurship Learning, Entrepreneurial Interest, and Student Business Innovation

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Received: February 29, 2026; **Revised:** April 02, 2026; **Accepted:** June 19, 2026

Abstract: Global digital economic transformation requires young entrepreneurs to develop innovative capabilities supported by digital technology utilization. This study aims to analyze the effect of entrepreneurship learning and entrepreneurial interest on student business innovation through digital technology utilization as a mediating variable. This study employed a quantitative approach with an explanatory survey design. The sample consisted of 361 student entrepreneurs from the Faculty of Economics and Business, Universitas Negeri Makassar, selected using purposive sampling. Data were collected using a four-point Likert-scale questionnaire and analyzed through Partial Least Squares-Structural Equation Modeling (PLS-SEM) using SmartPLS 4.0. The findings show that entrepreneurship learning and entrepreneurial interest significantly influence business innovation. Digital technology utilization also mediates these relationships. These findings indicate that student business innovation is not sufficiently driven by knowledge and interest alone, but also requires digital capability as a bridge toward innovative business action.

Keywords: Entrepreneurship Learning, Entrepreneurial Interest, Digital Technology Utilization, Business Innovation, Student Entrepreneurship

How to Cite: Ramadhani, N. R. D., Supatminingsih, T., & Nurjannah, N. (2026). When Entrepreneurial Interest is Not Enough: Digital Technology Utilization as a Mediator between Entrepreneurship Learning, Entrepreneurial Interest, and Student Business Innovation. *Journal of Economic Education and Entrepreneurship Studies*, 7(3), 193–204. <https://doi.org/10.62794/je3s.v7i3.338>
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INTRODUCTION

The development of the digital economy has brought fundamental changes to the field of entrepreneurship, particularly in the way business actors identify opportunities, create value, build relationships, and develop innovation. Entrepreneurship today is no longer determined solely by an individual's courage to start a business, but also by the ability to use digital technology as a strategic resource. Through digital technology, innovation in products, services, work processes, and business models can take place more rapidly and responsively. From the perspective of digital entrepreneurship, digital technology is viewed as having an important role in shaping new entrepreneurial practices that are more open, adaptive, and grounded in connectivity (Autio et al., 2018). Therefore, student entrepreneurs, as part of the productive

younger generation, are expected not only to possess entrepreneurial interest but also to be able to integrate digital technology into business activities so that the innovations they produce are aligned with market needs.

Higher education institutions play an important role in developing students' entrepreneurial capacity through entrepreneurship learning that is systematically designed, applicable, and relevant to current developments. Various studies have shown that entrepreneurship education contributes to the formation of an entrepreneurial mindset, the strengthening of self-efficacy, inspiration, and students' entrepreneurial intention (Benitez et al., 2018a). However, in the digital era, entrepreneurship learning cannot merely focus on mastering business concepts, preparing business plans, or fostering entrepreneurial interest. It should also be directed toward strengthening technology-based innovative capabilities, considering that entrepreneurial activities now take place within an increasingly digitalized ecosystem and are strongly influenced by individuals' ability to utilize digital platforms, social media, e-commerce, digital payment systems, and market information.

Entrepreneurial interest is often regarded as one of the key predictors of entrepreneurial behavior. Nevertheless, strong interest does not automatically lead to business innovation. In practice, students may show a strong interest in entrepreneurship and may even already be running a business, but the innovation they generate may not necessarily develop if the business is still managed conventionally. This condition may occur when marketing strategies remain less creative, technology use is still limited, and business decisions are not yet based on digital information. Such a situation indicates a gap between entrepreneurial interest and business innovation. This gap can be bridged through the use of digital technology, as technology enables business actors to reach broader markets, accelerate communication with consumers, improve business processes, and create new forms of value in entrepreneurial activities (Verhoef et al., 2021)

A number of previous studies have emphasized that digital technology plays an important role in shaping entrepreneurial ecosystems, expanding business opportunities, and accelerating the innovation process. The concept of the digital entrepreneurial ecosystem explains that digital entrepreneurship emerges through the interaction among technology, actors, institutions, and networks that enable the creation of new business opportunities (Sussan & Acs, 2017) In addition, digital technology is also understood as an external enabler that can accelerate the formation of new ventures while encouraging changes in entrepreneurial innovation processes (von Briel et al., 2018). Thus, digital technology does not merely function as an operational support tool but also serves as a strategic mechanism that connects knowledge, interest, and innovative action in students' business activities.

Studies on digital entrepreneurship education have also increasingly reinforced the importance of integrating technology into entrepreneurship learning. (Rippa & Secundo, 2019) explain that digital technology has great potential to expand the practice of academic entrepreneurship. (Secundo et al., 2020) found that digital transformation in entrepreneurship education centers can enrich learning experiences, strengthen collaboration, and encourage innovation creation. More recent findings also indicate that digital entrepreneurship education can enhance students' digital entrepreneurial intention, particularly when the learning process is able to develop readiness, alertness, and an opportunity-oriented entrepreneurial mindset (Wibowo et al., 2023) This condition confirms that entrepreneurship learning needs to shift from a conventional approach toward one that is more digital, practical, and innovation-oriented.

Nevertheless, most previous studies have tended to focus more on the direct effect of entrepreneurship learning on entrepreneurial interest, or on the relationship between entrepreneurial interest and entrepreneurial behavior. Meanwhile, the mechanism explaining how learning and interest can develop into business innovation still requires deeper examination. In the context of students who already run businesses, the use of digital technology becomes an important variable to analyze because it can explain the transformation process from knowledge and interest into concrete innovation. In other words, digital technology has the potential to act as a capability bridge that connects entrepreneurship learning and entrepreneurial interest with students' business innovation. This research gap forms the basis of the novelty of this study, which positions the use of digital technology as a mediating variable in the relationship between entrepreneurship learning, entrepreneurial interest, and students' business innovation.

Theoretically, this study is built upon the integration of the Theory of Planned Behavior, the digital entrepreneurship perspective, and the digital capability approach. The Theory of Planned Behavior explains that intention is an important factor that encourages individuals to act. However, the realization of entrepreneurial behavior is still influenced by individuals' ability to control and utilize available resources. In digital entrepreneurship, these resources increasingly take the form of digital technology, which enables individuals to develop opportunities and innovation more effectively (Nambisan, 2017). Meanwhile, the digital capability approach emphasizes that digital transformation requires business actors to be able to integrate technology into business strategies, processes, and value (Li et al., 2018). Therefore, the use of digital technology becomes an important element in explaining how entrepreneurship learning and entrepreneurial interest can contribute to the emergence of business innovation.

Based on the above discussion, this study aims to analyze the effect of entrepreneurship learning and entrepreneurial interest on students' business innovation through the use of digital technology as a mediating variable. This study was conducted on students of the Faculty of Economics and Business, Universitas Negeri Makassar, who already have businesses, making the empirical context relevant to the dynamics of student entrepreneurship in higher education. Theoretically, this study is expected to broaden the discourse on student entrepreneurship by positioning digital technology as a connecting mechanism among learning, interest, and innovation. Practically, the findings of this study are expected to provide a basis for higher education institutions in designing entrepreneurship learning that is more applicable, technology-based, and oriented toward strengthening students' business innovation.

METHOD

This study used a quantitative approach with an explanatory survey design to examine the direct and indirect effects of entrepreneurship learning and entrepreneurial interest on students' business innovation through the use of digital technology as a mediating variable. Entrepreneurship learning and entrepreneurial interest were treated as exogenous variables, the use of digital technology as the mediating variable, and business innovation as the endogenous variable.

The study population consisted of students from the Faculty of Economics and Business, Universitas Negeri Makassar, who had established or were currently running a business. A total of 361 student entrepreneurs were selected using purposive sampling based on the criteria of being active students, having business experience, having received entrepreneurship learning, and being willing to participate.

Data were collected online and offline using a closed-ended questionnaire with a four-point Likert scale ranging from 1 = strongly disagree to 4 = strongly agree. Entrepreneurship learning was measured through understanding of entrepreneurial concepts, managerial skills, creativity, and entrepreneurial attitude. Entrepreneurial interest was measured through confidence in starting a business, independence, opportunity orientation, and achievement motivation. The use of digital technology was assessed through social media, e-commerce, digital financial services, and online business communication, while business innovation was measured through new idea development, product or service innovation, marketing creativity, and utilization of market opportunities.

All respondents were informed about the study purpose, identity confidentiality, academic use of data, and voluntary participation, while the principles of consent, anonymity, and data confidentiality were maintained. The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The measurement model was evaluated through outer loading, Average Variance Extracted (AVE), Cronbach’s Alpha, Composite Reliability, Fornell-Larcker criterion, cross-loading, and Heterotrait-Monotrait Ratio (HTMT). The structural model was assessed using Variance Inflation Factor (VIF), R^2 , f^2 , Q^2 , and bootstrapping. Relationships were considered significant when the t-statistic was > 1.96 and the p-value was < 0.05 , while mediation effects were tested through specific indirect effects.

RESULTS AND DISCUSSION

Research Results

This study involved 361 student entrepreneurs from the Faculty of Economics and Business, Universitas Negeri Makassar.

Table 1. Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	73	20.2%
	Female	288	79.8%
Age	18 years old	92	25.48%
	19 years old	83	22.99%
	20 years old	89	24.65%
	21 years old	64	17.73%
	22 years old	33	9.14%
Department	Economic Education	108	29.9%
	Management	90	24.9%
	Digital Business	36	10%
	Accounting S1	36	10%
	Entrepreneurship	34	9.4%
	Development Economics	26	7.2%
	Accounting D4	20	5.5%
	Accounting Education	11	3%

Source: Processed data, 2025.

The respondent characteristics show that most participants were female, totaling 288 students or 79.8%, while male respondents accounted for 73 students or 20.2%. In terms of age, the respondents were dominated by students aged 18–20 years. Meanwhile, based on study program, most respondents came from Economic Education and Management.

The evaluation of the measurement model indicates that all constructs in this study met the required standards of validity and reliability.

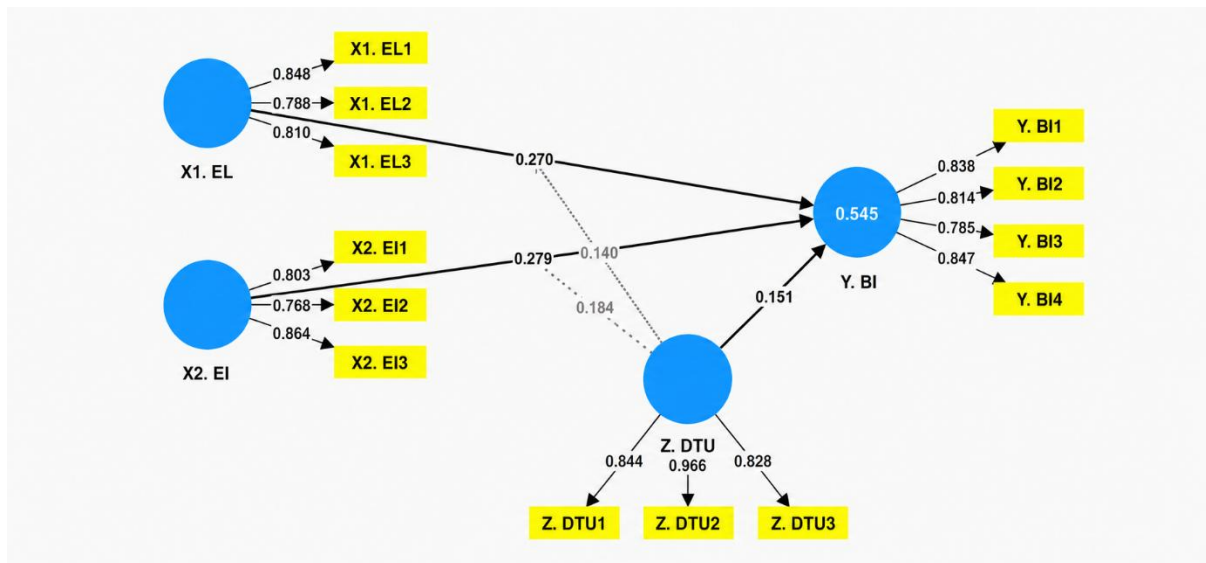


Figure 1. Measurement Model

Source: SmartPLS output, 2025

Table 2. Outer Loading

Variable	Indicator	Outer Loading	p-value	Description
Entrepreneurship Learning	X1.EL1	0.848	0.000	Valid and significant
	X1.EL2	0.788	0.000	Valid and significant
	X1.EL3	0.810	0.000	Valid and significant
Entrepreneurial Interest	X2.EI1	0.803	0.000	Valid and significant
	X2.EI2	0.768	0.000	Valid and significant
	X2.EI3	0.864	0.000	Valid and significant
Digital Technology Utilization	Z.DTU1	0.844	0.000	Valid and significant
	Z.DTU2	0.966	0.000	Valid and significant
	Z.DTU3	0.828	0.000	Valid and significant
Business Innovation	Y.BI1	0.838	0.000	Valid and significant
	Y.BI2	0.814	0.000	Valid and significant
	Y.BI3	0.785	0.000	Valid and significant
	Y.BI4	0.847	0.000	Valid and significant

Source: Processed data, 2025.

Based on Table 2, all indicators have outer loading values above 0.70 and p-values of 0.000. These results indicate that all indicators meet the criteria for convergent validity and are statistically significant in measuring their respective constructs. Therefore, the indicators of Entrepreneurship Learning, Entrepreneurial Interest, Digital Technology Utilization, and Business Innovation are considered valid and appropriate for further structural model testing.

Table 3. R-square Values

Endogenous Variable	R-square	Interpretation
Business Innovation (Y)	0.545	Moderate

Source: Processed data, 2025.

Based on Table 3, the R-square value for the Business Innovation variable is 0.545. This value indicates that Entrepreneurship Learning, Entrepreneurial Interest, and Digital Technology Utilization explain 54.5% of the variance in Business Innovation. Meanwhile, the remaining 45.5% is explained by other variables outside the research model. Therefore, the structural model in this study has a moderate explanatory power.

Next, the results of the structural model can be seen in the following image.

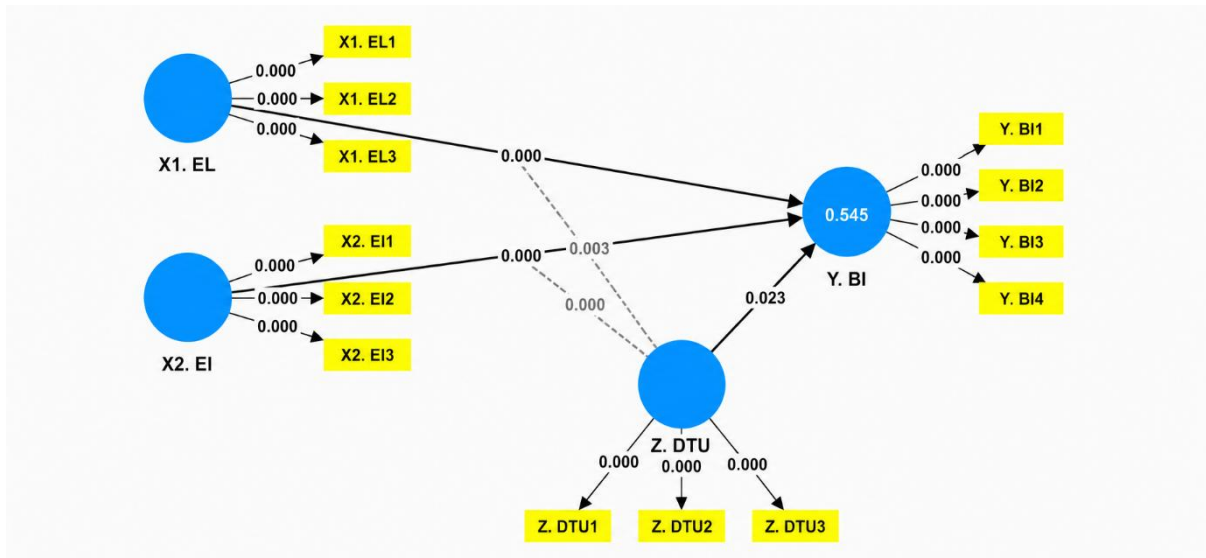


Figure 2. Structural Model

Source: SmartPLS output, 2025

Table 4. Path Coefficient and Significance

Variables Relationship	Path Coefficient	p-value	Description
X1 → Y	0.270	0.000	Positive and significant
X2 → Y	0.279	0.000	Positive and significant
Z → Y	0.151	0.023	Positive and significant
X1 → Z	0.140	0.000	Positive and significant
X2 → Z	0.184	0.000	Positive and significant

Source: Processed data, 2025.

Based on Table 4, all direct relationships among variables show positive and significant effects. Entrepreneurship Learning positively affects Business Innovation with a coefficient of 0.270 and p-value of 0.000, while Entrepreneurial Interest has a slightly stronger effect with a coefficient of 0.279 and p-value of 0.000. Digital Technology Utilization also contributes significantly to Business Innovation with a coefficient of 0.151 and p-value of 0.023, although its effect is relatively smaller. Furthermore, Entrepreneurship Learning positively affects Digital Technology Utilization with a coefficient of 0.140 and p-value of 0.000, while Entrepreneurial Interest also positively affects Digital Technology Utilization with a coefficient of 0.184 and p-value of 0.000. These findings indicate that entrepreneurship learning, entrepreneurial interest, and digital technology utilization play important roles in strengthening students’ business innovation.

Table 5. Indirect Effect

Indirect Relationship	Indirect Effect	p-value	Description
X1 → Z → Y	0.021	0.003	Positive and significant mediation
X2 → Z → Y	0.028	0.000	Positive and significant mediation

Source: Processed data, 2025.

Based on Table 5, Digital Technology Utilization significantly mediates the relationship between Entrepreneurship Learning and Business Innovation, with an indirect effect of 0.021 and a p-value of 0.003. It also significantly mediates the relationship between Entrepreneurial Interest and Business Innovation, with an indirect effect of 0.028 and a p-value of 0.000. Although the indirect effects are relatively small, both mediation paths are statistically significant, indicating

that Digital Technology Utilization plays an important mediating role in strengthening students' business innovation.

Overall, the results show that all proposed hypotheses are supported. Entrepreneurship Learning, Entrepreneurial Interest, and Digital Technology Utilization have positive and significant effects on Business Innovation. In addition, Digital Technology Utilization significantly mediates the effects of Entrepreneurship Learning and Entrepreneurial Interest on Business Innovation. These findings suggest that students' business innovation is shaped not only by learning and entrepreneurial motivation but also by their ability to utilize digital technology in business activities.

Discussion

The findings of this study reveal that entrepreneurship learning, entrepreneurial interest, and the use of digital technology play interconnected roles in encouraging students' business innovation. These results indicate that business innovation does not simply emerge because students already own or run a business, but is shaped through the combination of learning experiences, psychological motivation to engage in entrepreneurship, and the ability to use digital technology in business activities. In this regard, entrepreneurship learning and entrepreneurial interest can be positioned as the initial foundation that shapes students' readiness, while the use of digital technology serves as a mechanism that translates knowledge and interest into more tangible innovative actions. This finding is consistent with (Maresch et al., 2016), (Hahn et al., 2017), Hägg and Gabrielsson (2020), and (Lackéus, 2020) who emphasize that entrepreneurship education in higher education institutions will have a more optimal impact when it is directed toward practical, contextual learning experiences and oriented toward actual entrepreneurial behavior.

The influence of entrepreneurship learning on the use of digital technology and business innovation indicates that the learning process serves as an important source in shaping students' entrepreneurial knowledge, skills, and mindset. Applied entrepreneurship learning enables students to understand market opportunity dynamics, design business strategies, manage resources, and develop creativity in products, services, and marketing. For students who are already running businesses, practice-based learning provides opportunities to test business ideas, observe consumer responses, and continuously improve business models. This supports the findings of (Pocek et al., 2021) and (Smolka et al., 2024), who state that effective entrepreneurship education should emphasize learning experiences, the courage to take action, and the formation of entrepreneurial behavior, rather than merely increasing conceptual understanding. Thus, entrepreneurship learning in this study does not only function as a means of knowledge transfer, but also as an instrument for developing students' innovative capacity.

Entrepreneurial interest was also found to influence the use of digital technology and business innovation. This finding suggests that students with strong entrepreneurial interest tend to be more active in seeking opportunities, more willing to try new strategies, and more open to using digital technology to support business development. Such interest encourages students not only to maintain existing businesses, but also to introduce improvements through product innovation, digital promotion, customer service enhancement, and market expansion. This result aligns with (Shirokova et al., 2016) and (Gieure et al., 2020), who argue that entrepreneurial intention is an important predictor in explaining the transition from desire to entrepreneurial action. However, the findings of this study also show that entrepreneurial interest needs to be

supported by the ability to access and use digital resources in order to generate more concrete business innovation.

The use of digital technology was proven to have a significant effect on students' business innovation. This finding strengthens the view that digital technology does not merely function as an operational support tool, but also as a source of strategic capability in creating new value. The use of social media, e-commerce, digital financial services, and online business communication enables students to reach wider markets, understand consumer needs, accelerate transactions, and design more creative marketing strategies. This result is in line with (Vial, 2019) and Warner and (Warner & Wäger, 2019), who explain that digital transformation requires business actors to integrate technology into the value creation process. In addition (Ferreira et al., 2019) (Khin & Ho, 2018), (Matarazzo et al., 2021), and (Benitez et al., 2018b) also emphasize that digital capability can strengthen innovation and business performance through the development of more adaptive processes, services, and business models.

The mediation test results show that the use of digital technology significantly bridges the effect of entrepreneurship learning on business innovation. This means that entrepreneurship learning will be more effective in encouraging innovation when students are able to apply the knowledge and skills they have acquired into digital-based business practices. Understanding business opportunities, creativity, management, and marketing does not automatically lead to innovation if students do not yet have the means and ability to implement them within a digital ecosystem. In this context, digital technology acts as a capability bridge that helps students connect entrepreneurial knowledge with innovative action. This finding is consistent with (Cenamor et al., 2019), (Pagani & Pardo, 2017), and (Kumar et al., 2020), who show that technology and digital platforms can strengthen business capabilities in building networks, managing market relationships, improving efficiency, and promoting innovation.

The use of digital technology was also found to mediate the effect of entrepreneurial interest on business innovation. This finding confirms that strong entrepreneurial interest does not necessarily generate innovation unless it is accompanied by the ability to use digital technology productively. Students with a strong drive to become entrepreneurs still need media to execute ideas, reach consumers, test markets, and improve the products or services they offer. Digital technology provides space for these processes to be carried out more quickly, cost-effectively, flexibly, and measurably. This is in line with (Chatterjee et al., 2022), (Khurana et al., 2022), Jiang et al. (2023), and (Vrontis et al., 2022), who show that digitalization, digital platform capability, and entrepreneurial orientation (Schimperna et al., 2022) can strengthen entrepreneurial processes, business resilience, and innovation performance. Therefore, the results of this study reinforce the main idea that "interest alone is not enough"; students' business innovation requires the use of digital technology as a mechanism that connects intention with business action.

From a theoretical perspective, this study contributes to expanding the understanding of the relationship between entrepreneurship learning, entrepreneurial interest, and students' business innovation through the lens of digital capability. While many previous studies have positioned entrepreneurship learning and entrepreneurial interest as direct predictors of entrepreneurial behavior, this study shows that the use of digital technology acts as a mediating mechanism that explains how knowledge and interest can develop into business innovation. This finding is relevant to the study of student entrepreneurship, which emphasizes the importance of campus ecosystem support, practical experience, and students' connectedness with the broader

business environment (Schimperna et al., 2022). Therefore, this study strengthens the position of digital technology as an important element in the student entrepreneurship ecosystem.

Practically, the findings of this study imply that higher education institutions need to strengthen digital practice-based entrepreneurship learning. Entrepreneurship courses should not be limited to the preparation of business plans, but should also integrate digital marketing practices, e-commerce, financial technology, digital market analysis, business content design, and the use of business platforms. In addition, higher education institutions need to expand support through business incubators, mentoring for student businesses, collaboration with industry actors, and technology-based entrepreneurship projects. This approach is important because entrepreneurship education in the digital era must be able to equip students with the ability to learn, adapt, experiment, and innovate continuously (Ratten & Jones, 2021). Thus, students' business innovation can develop not only because of interest and learning, but also because students possess the digital capacity to transform ideas into real business value.

CONCLUSIONS

This study concludes that entrepreneurship learning and entrepreneurial interest significantly influence student business innovation, both directly and through digital technology utilization. The findings indicate that business innovation is not sufficiently supported by entrepreneurial knowledge and interest alone; it also requires students' ability to utilize digital technology as a bridge toward innovative business actions. Theoretically, this study strengthens the position of digital technology as a *capability bridge* in student entrepreneurship. Practically, higher education institutions need to develop practice-based digital entrepreneurship learning through digital marketing, e-commerce, financial technology, business incubators, and entrepreneurial mentoring so that student business innovation becomes more adaptive and sustainable.

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