

Generative AI Use in Entrepreneurship Learning and Entrepreneurial Intention among Indonesian University Students

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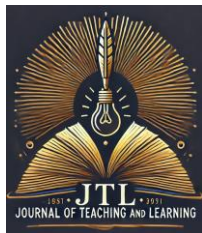
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Abstract: Generative Artificial Intelligence (AI) offers new opportunities to enhance teaching and learning in entrepreneurship education by supporting idea generation, problem-solving, and the development of students' entrepreneurial capabilities. However, the mechanisms through which Generative AI use relates to entrepreneurial intention in higher education remain insufficiently understood. This study examines the relationship between Generative AI use and entrepreneurial intention among Indonesian university students, with particular attention to the mediating role of entrepreneurial self-efficacy and the implications for AI-supported entrepreneurship learning. A quantitative approach was employed using purposive sampling, involving 320 university students in Indonesia. Data were collected through an online questionnaire and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that Generative AI use positively influences entrepreneurial self-efficacy ($\beta = 0.421$) and entrepreneurial intention ($\beta = 0.265$). Entrepreneurial self-efficacy also positively influences entrepreneurial intention ($\beta = 0.240$) and partially mediates the relationship between Generative AI use and entrepreneurial intention ($\beta = 0.101$). These findings suggest that Generative AI may contribute to entrepreneurship learning by supporting students' confidence in their entrepreneurial capabilities and strengthening their intention to pursue entrepreneurial activities. The study highlights the importance of integrating Generative AI into entrepreneurship teaching and learning through structured learning activities, opportunities for practical application, and responsible AI use. Such integration should focus not only on technology adoption but also on developing students' entrepreneurial self-efficacy and learning outcomes.

Keywords: Generative AI Use, Entrepreneurial Intention, Entrepreneurial Self-Efficacy, Artificial Intelligence, Entrepreneurship Education.

INTRODUCTION

Generative artificial intelligence has rapidly changed how university students acquire knowledge, generate ideas, solve problems, and complete complex academic tasks. Applications such as ChatGPT, Gemini, Claude, and Microsoft Copilot enable students to generate ideas, analyze information, and support entrepreneurial activities such as opportunity recognition and business planning (Dwivedi et al., 2023). A survey of 399 undergraduate and postgraduate students found broadly positive attitudes toward Generative AI because it supported personalized learning, writing, brainstorming, research, and analysis (Chan & Hu, 2023). Generative AI has also been incorporated into entrepreneurship learning activities to provide interactive exercises, idea



development, and immediate feedback (Darnell & Gopalkrishnan, 2024). However, its impact depends on how students use and evaluate the technology (Abbas et al., 2024). Therefore, access to Generative AI does not automatically produce entrepreneurial motivation. Further research must explain the psychological process through which its use may shape students' willingness to pursue entrepreneurship (Lo, 2023).

This issue is particularly relevant in Indonesian higher education, where students are increasingly exposed to AI-supported learning but differ in their readiness, perceived benefits, and concerns about its use. Helmiatin et al. (2024) found that perceived usefulness and risk significantly influenced AI adoption among Indonesian university students. These findings confirm that Indonesian students' engagement with AI is shaped by both perceived usefulness and perceived risk (Zawacki-Richter et al., 2020). Barus et al. (2025) reached a similar conclusion through a mixed-methods study involving an online survey of 111 Indonesian undergraduates and semi-structured interviews with 53 students. Although participants supported the integration of Generative AI into university curricula, they also emphasized the need for AI competence, ethical training, clear institutional guidelines, and misuse detection. Evidence connecting AI with entrepreneurship has also begun to emerge. Sutrisno et al. (2024), based on 139 students in Yogyakarta, reported that ChatGPT use influenced entrepreneurial intention as a significant mediator. However, the limited geographical scope and the use of innovative behaviour as the mediator leave entrepreneurial self-efficacy insufficiently examined within the Indonesian context (Abdullah et al, 2026).

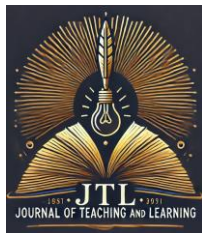
The present study uses the Stimulus-Organism-Response framework to explain this relationship. Entrepreneurial self-efficacy refers to students' confidence in their ability to recognise opportunities, generate viable ideas, organise resources, address uncertainty, and perform tasks required to establish a business. Entrepreneurial self-efficacy refers to students' confidence in their ability to recognise opportunities, generate viable ideas, organise resources, address uncertainty, and perform tasks required to establish a business (Bandura, 2020). Generative AI may strengthen this confidence by providing rapid feedback, simulations, alternative solutions, and low-risk opportunities to practise entrepreneurial tasks. Duong (2025) applied the Stimulus-Organism-Response framework to 504 undergraduate students in Vietnam



and found that AI literacy enhanced e-entrepreneurial self-efficacy and entrepreneurial identity. The direct relationship between AI literacy and e-entrepreneurial intention was not significant, but serial mediation through self-efficacy was significant. This result suggests that technological competence does not necessarily create entrepreneurial intention directly (Xanthopoulou & Sahinidis, 2024). Instead, its effects may depend on students internalising technology experiences as their own entrepreneurial capabilities.

Recent evidence provides more direct support for the mediating role of entrepreneurial self-efficacy. Xie and Wang (2025) analysed data from 346 university students and found that Generative AI-supported entrepreneurship education positively influenced entrepreneurial self-efficacy at $\beta = 0.523$ and entrepreneurial intention at $\beta = 0.244$, with both relationships significant at $p < .001$. Entrepreneurial self-efficacy also had a significant effect on entrepreneurial intention and partially mediated the effect of Generative AI-supported education. Nevertheless, that study examined students who had participated in AI-supported entrepreneurship education in China rather than students' broader use of Generative AI for entrepreneurial purposes. Duong (2025) focused on AI literacy and digital entrepreneurial intention in Vietnam, while Sutrisno et al. (2024) investigated ChatGPT use through innovative behaviour within one Indonesian city. Consequently, limited research has tested whether students' actual use of Generative AI influences general entrepreneurial intention through entrepreneurial self-efficacy across Indonesian universities (Tlili, 2023).

This study aims to examine the direct effect of Generative AI use on entrepreneurial intention among Indonesian university students and to determine whether entrepreneurial self-efficacy mediates this relationship. The central research question is: To what extent does entrepreneurial self-efficacy explain the relationship between Generative AI use and entrepreneurial intention among Indonesian university students? Four hypotheses are proposed. H1: Generative AI use has a positive effect on entrepreneurial self-efficacy. H2: Entrepreneurial self-efficacy has a positive effect on entrepreneurial intention. H3: Generative AI use has a positive effect on entrepreneurial intention. H4: Entrepreneurial self-efficacy mediates the effect of Generative AI use on entrepreneurial intention. Theoretically, this study extends the SOR framework by positioning students' actual Generative AI use as a technological stimulus and entrepreneurial self-efficacy as



the psychological process linking technology use to entrepreneurial intention. Based on this research gap, this study addresses the following research question: How does Generative AI use influence entrepreneurial intention among Indonesian university students, and to what extent does entrepreneurial self-efficacy mediate this relationship? Practically, the findings may help Indonesian universities design AI-supported entrepreneurship education that develops students' entrepreneurial capabilities rather than merely encouraging frequent technology use (Newman et al., 2021).

METHOD

Research Design and Data Recruitment

This study employed a purposive sampling approach to recruit university students from Indonesia who have experience using Generative Artificial Intelligence (Generative AI) applications. Purposive sampling was selected because this study requires respondents with specific characteristics relevant to the research objectives, particularly students who have interacted with Generative AI tools such as ChatGPT, Gemini, Claude, Microsoft Copilot, or similar applications. This approach allows the study to capture respondents' actual experiences in using Generative AI for learning activities, problem-solving, creativity development, and entrepreneurial exploration. University students were selected because they are increasingly exposed to AI technologies and are at a stage where entrepreneurial decisions become relevant. Moreover, university students are considered an appropriate population for examining entrepreneurial intention because they are approaching career decisions and may consider entrepreneurship as an alternative career pathway (Secundo et al., 2021). Previous studies have highlighted that technological exposure and entrepreneurial self-efficacy are important factors influencing students' entrepreneurial intention (Newman et al., 2021; Nowiński et al., 2020).

Data were collected through an online questionnaire distributed to active university students across Indonesia. The data collection process was conducted from June to August 2026 using digital survey platforms. Respondents were required to meet three criteria: (1) active university students in Indonesia, (2) have used at least one Generative AI application, and (3) voluntarily agreed to participate in the study. The online survey method was selected because it enables



efficient data collection from respondents located in different regions of Indonesia and is suitable for studying technology-related behaviours among digitally connected student populations. A total of 320 valid responses were obtained and retained for further analysis after screening the completeness of responses. The sample included students from various universities, academic backgrounds, and geographical regions in Indonesia. Participation was voluntary, and respondents were informed that their responses would be used only for academic purposes. No personal identification information was collected during the survey process. The demographic characteristics of respondents are presented in Table 1.

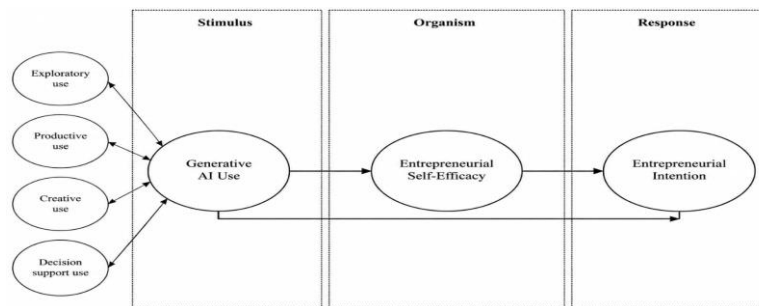


Figure 1. Research Conceptual Model

Variables	Categories	F	%
Gender	Male	237	74.1
	Female	73	22.8
	Prefer not to say	10	3.1
Academic level	First year	49	15.3
	Second year	78	24.4
	Third year	107	33.4
	Fourth year or above	86	26.9
Study program / Major	Business Management	130	40.6
	Digital Business	45	14.1
	Entrepreneurship	34	10.6



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Accounting	33	10.3
Hospitality & Tourism Business	30	9.4
Development Economics	15	4.7
Communication Science	13	4.1
Information Systems	11	3.4
Visual Communication Design	9	2.8
Generative AI usage frequency		
Several times a day	42	13.1
Every day	84	26.2
Several times a week	98	30.6
Several times a month	64	20.0
Rarely	32	10.0

Table 1. University Students' Demographic Profiles

Table 1 presents the demographic characteristics of the respondents. A total of 320 valid responses were collected from Indonesian university students. The majority of respondents were male (74.1%), while female respondents represented 22.8% of the sample. Regarding academic level, most respondents were third-year students (33.4%), followed by fourth-year students or above (26.9%). The respondents represented diverse academic backgrounds, with the largest group coming from Business Management (40.6%). From the Google Form that was taken, more than half of the respondents had previously taken entrepreneurship courses (55.9%). Regarding Generative AI usage frequency, most students reported using Generative AI several times a week (30.6%) and daily (26.2%), indicating that respondents had sufficient exposure to Generative AI.

The demographic profile indicates that the respondents represent an appropriate sample for examining the relationship between Generative AI Use, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention. The high level of Generative AI usage experience among participants suggests that they have sufficient familiarity with AI tools, allowing them to provide meaningful evaluations regarding the role of Generative AI in supporting entrepreneurial activities.

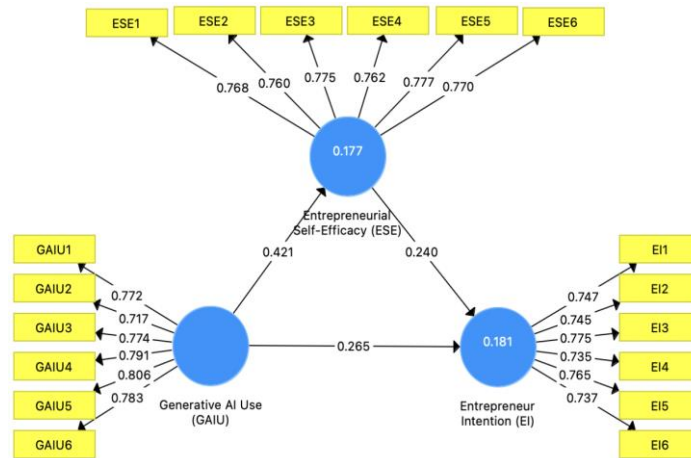


Figure 2. PLS-SEM structural model results

Construct	Item	Mean	SD	S	K	λ	VIF	α	CR	AVE
Generative AI Use (GAIU)	GAIU1	3.884	0.920	-	-	0.772	1.758	0.866	0.900	0.599
	GAIU2	3.781	0.878	-	-	0.717	1.616	—	—	—
	GAIU3	3.853	0.866	-	-	0.774	1.723	—	—	—
	GAIU4	3.788	0.890	-	-	0.791	1.873	—	—	—
	GAIU5	3.828	0.883	-	-	0.806	2.015	—	—	—
	GAIU6	3.803	0.845	-	-	0.783	1.882	—	—	—
Entrepreneurial Self-Efficacy (ESE)	ESE1	3.884	0.867	-	-	0.768	1.747	0.861	0.896	0.591
	ESE2	3.944	0.900	-	-	0.760	1.722	—	—	—
	ESE3	3.897	0.872	-	-	0.775	1.796	—	—	—
	ESE4	3.906	0.857	-	-	0.762	1.781	—	—	—
	ESE5	3.844	0.891	-	-	0.777	1.835	—	—	—
	ESE6	3.850	0.867	-	-	0.770	1.736	—	—	—
Entrepreneurial Intention (EI)	EI1	4.034	0.830	-	-	0.747	1.647	0.846	0.886	0.564
	EI2	4.009	0.760	-	-	0.745	1.636	—	—	—
	EI3	4.009	0.816	-	-	0.775	1.720	—	—	—
	EI4	3.988	0.855	-	-	0.735	1.667	—	—	—
	EI5	4.028	0.871	-	-	0.765	1.632	—	—	—
	EI6			-	-	0.737		—	—	—



EI6	3.988	0.806	-	-	0.737	1.677	—	—	—
			0.229	0.849					

Table 2. First-order confirmatory factor analysis results

Notes: $N = 320$. S = Skewness; K = Kurtosis; λ = Factor loading; VIF = Variance Inflation Factor; α = Cronbach's alpha; CR = Composite Reliability; AVE = Average Variance Extracted.

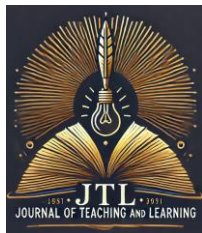
Research Instrument

The constructs in this study were measured using established measurement scales adapted from previous research. The questionnaire consisted of three main constructs: Generative AI Use, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention. All measurement items were evaluated using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Generative AI Use construct was measured using six items developed from previous studies on artificial intelligence usage behaviour and students' interactions with AI-based technologies (Chan & Hu, 2023; Helmiatin et al., 2024). The items measured students' use of Generative AI applications to explore information, generate ideas, improve productivity, and support academic and entrepreneurial activities.

Entrepreneurial Self-Efficacy was measured using six items adapted from established entrepreneurship research (Newman et al., 2021). The construct assessed students' confidence in performing entrepreneurial activities, including identifying business opportunities, developing innovative ideas, solving entrepreneurial problems, and managing the challenges associated with starting a business. Entrepreneurial Intention was measured using six items adapted from Liñán and Chen (2009), which have been widely applied and validated in entrepreneurial intention studies. The items evaluated students' willingness, commitment, and plans to establish or operate their own business. The questionnaire was initially prepared in English and translated into Indonesian to ensure that the items were understandable and culturally appropriate for Indonesian university students.

Common Method Variance

To assess the possibility of common method variance (CMV), this study conducted a collinearity assessment using the variance inflation factor (VIF) approach. Since the data were collected through a self-reported questionnaire from the same respondents, potential bias caused by the measurement method was considered. The VIF values of all measurement indicators were examined to identify possible multicollinearity issues among the constructs.



As presented in Table 2, the VIF values ranged from 1.616 to 2.015, which are below the recommended threshold of 5.0 (Hair et al., 2022). These findings indicate that the measurement indicators did not experience problematic collinearity. Therefore, the likelihood that common method variance significantly influenced the results of this study is considered minimal. Furthermore, the acceptable VIF values confirm that the relationships among Generative AI Use, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention are unlikely to be distorted by common method bias. Thus, the dataset is considered appropriate for further structural model.

RESULT AND DISCUSSION

Measurement Model Assessment

The measurement model was evaluated to assess the reliability and validity of the constructs before examining the structural relationships. The assessment included indicator reliability, internal consistency reliability, convergent validity, and collinearity assessment. The results of the first-order confirmatory factor analysis are presented in Table 2. The results indicate that all measurement indicators achieved acceptable factor loading values. The outer loading values ranged from 0.717 to 0.806 for Generative AI Use, from 0.760 to 0.777 for Entrepreneurial Self-Efficacy, and from 0.735 to 0.775 for Entrepreneurial Intention. All indicator loadings exceeded the recommended threshold of 0.70, demonstrating satisfactory indicator reliability (Hair et al., 2022).

The internal consistency reliability was assessed using Cronbach's alpha (α) and Composite Reliability (CR). The findings show that all constructs achieved acceptable reliability levels. Generative AI Use obtained a Cronbach's alpha of 0.866 and Composite Reliability of 0.900. Entrepreneurial Self-Efficacy achieved an alpha value of 0.861 and a CR value of 0.896, while Entrepreneurial Intention obtained an alpha value of 0.846 and a CR value of 0.886. These values exceeded the recommended minimum threshold of 0.70, confirming that all constructs demonstrated adequate internal consistency. Furthermore, convergent validity was evaluated using Average Variance Extracted (AVE). The AVE values were 0.599 for Generative AI Use, 0.591 for Entrepreneurial Self-Efficacy, and 0.564 for Entrepreneurial Intention. Since all AVE values exceeded the minimum requirement of 0.50, the constructs demonstrated sufficient convergent validity. The assessment of multicollinearity was conducted through the Variance Inflation Factor



(VIF). The VIF values ranged from 1.616 to 2.015, which were substantially below the recommended threshold of 5.0. Therefore, no critical collinearity issues were identified among the measurement indicators. Overall, the measurement model results confirm that the research instruments possess adequate reliability, convergent validity, and acceptable measurement quality for further structural model evaluation.

Structural Model Assessment and Hypothesis Testing

After confirming the adequacy of the measurement model, the structural model was examined to evaluate the proposed relationships among Generative AI Use, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention. The hypothesis testing was conducted using the bootstrapping procedure in SmartPLS with 5,000 resamples (Sarstedt et al., 2022). Table 3 presents the structural model analysis.

Hypothesis Relationship		β	t-value	p-value	Decision
H1	Generative AI Use $\rightarrow$ Entrepreneurial Self-Efficacy	0.421	9.208	< 0.001	Supported
H2	Entrepreneurial Self-Efficacy $\rightarrow$ Entrepreneurial Intention	0.240	4.203	< 0.001	Supported
H3	Generative AI Use $\rightarrow$ Entrepreneurial Intention	0.265	4.624	< 0.001	Supported

Table 3. Structural Model and Hypothesis Testing Results

The first hypothesis (H1) proposed that Generative AI Use positively influences Entrepreneurial Self-Efficacy. The results support this hypothesis, showing a significant positive relationship ($\beta = 0.421$, $t = 9.208$, $p < 0.001$). This finding indicates that students who use Generative AI more actively tend to develop stronger confidence in performing entrepreneurial activities (Khan et al., 2021). Generative AI applications may provide students with resources for exploring business ideas, analysing information, generating solutions, and improving decision-making processes, thereby increasing their perceived entrepreneurial capability.

The second hypothesis (H2) examined the relationship between Entrepreneurial Self-Efficacy and Entrepreneurial Intention. The findings show a significant positive effect ($\beta = 0.240$, $t = 4.203$, $p < 0.001$), indicating that students with stronger entrepreneurial confidence demonstrate higher intentions to pursue entrepreneurial activities. This result confirms the importance of psychological capability in entrepreneurship development, where confidence in managing



entrepreneurial tasks influences individuals' willingness to establish future businesses (Campbell et al., 2020).

The third hypothesis (H3) investigated the direct influence of Generative AI Use on Entrepreneurial Intention. The results demonstrate a significant positive relationship ($\beta = 0.265$, $t = 4.624$, $p < 0.001$). This finding suggests that Generative AI not only supports academic activities but also encourages entrepreneurial motivation by enabling students to explore opportunities, develop business concepts, and access strategic information.

Explanatory Power and Effect Size Analysis

The explanatory capability of the structural model was evaluated through the coefficient of determination (R^2). The results indicate that Generative AI Use explains 17.7% of the variance in Entrepreneurial Self-Efficacy ($R^2 = 0.177$). Furthermore, Generative AI Use and Entrepreneurial Self-Efficacy jointly explain 18.1% of the variance in Entrepreneurial Intention ($R^2 = 0.181$). Although the explained variance indicates a moderate predictive contribution, entrepreneurial intention is a complex psychological outcome influenced by various personal and environmental factors. Therefore, the current model provides meaningful evidence regarding the role of AI technology and entrepreneurial confidence while acknowledging that additional factors may contribute to students' entrepreneurial decisions (Kraus et al., 2021).

The effect size (f^2) analysis shows that Generative AI Use has a medium effect on Entrepreneurial Self-Efficacy ($f^2 = 0.215$). Meanwhile, the effect of Generative AI Use on Entrepreneurial Intention ($f^2 = 0.070$) and the effect of Entrepreneurial Self-Efficacy on Entrepreneurial Intention ($f^2 = 0.058$) represent small effects. These findings indicate that Generative AI plays a stronger role in developing students' entrepreneurial confidence than directly influencing entrepreneurial intention.

Mediation Analysis of Entrepreneurial Self-Efficacy

To examine the mediating role of Entrepreneurial Self-Efficacy, an indirect effect analysis was conducted. The results are presented in Table 4.

Hypothesis	Relationship	β	t-value	p-value	Decision
H4	Generative AI Use $\rightarrow$ Entrepreneurial Self-Efficacy $\rightarrow$ Entrepreneurial Intention	0.101	3.576	< 0.001	Supported



Table 4. Mediation Effect Analysis

The mediation analysis confirms that Entrepreneurial Self-Efficacy significantly mediates the relationship between Generative AI Use and Entrepreneurial Intention ($\beta = 0.101$, $t = 3.576$, $p < 0.001$). Since the direct effect of Generative AI Use on Entrepreneurial Intention remains significant ($\beta = 0.265$), Entrepreneurial Self-Efficacy functions as a partial mediator. This finding indicates that Generative AI influences entrepreneurial intention through two mechanisms. First, students may directly perceive Generative AI as a useful tool for entrepreneurial exploration. Second, Generative AI strengthens students' confidence in their entrepreneurial abilities, which subsequently increases their intention to pursue entrepreneurship.

Model Fit Assessment

The goodness of fit of the proposed model was evaluated using several fit indicators. The model produced an SRMR value of 0.054, which is below the threshold of 0.08. Additionally, the Normalized Fit Index (NFI) reached 0.908, exceeding the minimum value of 0.90.

Indicator	Value
SRMR	0.054
d_ULS	0.493
d_G	0.120
Chi-square	219.766
NFI	0.908

Table 5. Model Fit Assessment

These results demonstrate that the proposed model has an acceptable level of fit and is appropriate for explaining the relationships among Generative AI Use, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention. Furthermore, the results confirm that the structural model provides a reliable basis for testing the proposed hypotheses and examining the mediating role of Entrepreneurial Self-Efficacy in the relationship between Generative AI Use and Entrepreneurial Intention.

Key Findings & Discussion

The findings demonstrate that Generative AI Use significantly contributes to entrepreneurial development among Indonesian university students. The positive relationship between Generative AI Use and Entrepreneurial Self-Efficacy indicates that AI interaction can strengthen students' confidence in performing entrepreneurial activities. This finding supports the Stimulus-Organism-Response (SOR) framework, where technology adoption acts as an external stimulus that influences internal psychological states. The result is consistent with Duong (2025), who found



that AI literacy enhances entrepreneurial self-efficacy by improving students' ability to utilize digital technologies for entrepreneurial purposes. Similarly, Xie and Wang (2025) confirmed that Generative AI-supported learning environments can strengthen entrepreneurial self-efficacy. The significant relationship between Entrepreneurial Self-Efficacy and Entrepreneurial Intention highlights the importance of psychological capability in entrepreneurial decision-making. Students with stronger confidence in their entrepreneurial abilities are more likely to develop intentions to start a business. This finding supports previous entrepreneurship research emphasizing self-efficacy as a key determinant of entrepreneurial intention (Newman et al., 2021). Furthermore, the direct effect of Generative AI Use on Entrepreneurial Intention suggests that Generative AI can function as an entrepreneurial support tool by assisting students in idea generation, opportunity recognition, and business planning.

The mediation analysis provides the main theoretical contribution of this study by demonstrating that Entrepreneurial Self-Efficacy partially explains the relationship between Generative AI Use and Entrepreneurial Intention. This finding extends previous studies that mainly focused on AI adoption or AI literacy by highlighting the psychological mechanism underlying technology-driven entrepreneurial behaviour. Practically, universities should integrate Generative AI into entrepreneurship education to support opportunity exploration, innovation activities, and business development while maintaining ethical and responsible AI usage. This study has several limitations. The cross-sectional design limits the ability to examine changes in entrepreneurial intention over time. Additionally, the sample was limited to Indonesian university students, reducing generalisability to other contexts. Future research may apply longitudinal approaches and incorporate additional variables, such as AI literacy, digital competence, entrepreneurial education, and social support.

CONCLUSION

This study confirms that Generative AI Use positively influences Entrepreneurial Self-Efficacy and Entrepreneurial Intention among Indonesian university students. Entrepreneurial Self-Efficacy also significantly affects Entrepreneurial Intention and partially mediates the relationship between Generative AI Use and Entrepreneurial Intention. These findings highlight that Generative AI can support entrepreneurial development by strengthening students' confidence and motivation to pursue entrepreneurship. Universities are encouraged to integrate Generative AI into entrepreneurship education while promoting responsible and ethical AI usage. Its cross-



sectional design and student-based sample limit this study; therefore, future research may consider broader populations and additional variables.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Generative AI Declaration

The authors used generative artificial intelligence tools only for language improvement and manuscript editing support, while the research design, data analysis, interpretation, and final content were independently developed and verified by the authors.

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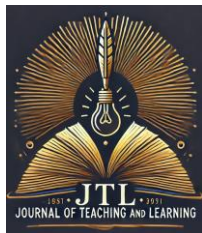
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