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Teacher support, entrepreneurial learning, and self-regulated learning predict vocational students' entrepreneurial intentions

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ABSTRACT

This study examines the effects of entrepreneurial learning, teacher support, and self-directed learning on the entrepreneurial intentions of vocational students and explores the mediating role of entrepreneurial learning and independent learning. Quantitative causal design was used by involving 303 Class XI students from nine public vocational schools in Pesisir Selatan Regency, Indonesia. Data were collected through questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Entrepreneurship learning had the strongest direct effect on entrepreneurial intention ($\beta = 0.497$, $p < 0.005$), followed by teacher support ($\beta = 0.211$, $p = 0.006$). Entrepreneurial learning significantly mediated the relationship between teacher support and entrepreneurial intent ($\beta = 0.339$, $p < 0.005$). Improving teacher support, entrepreneurship education, and self-paced learning is essential to strengthen the entrepreneurial intentions of vocational students.

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Introduction

Entrepreneurship has become a strategic driver of economic growth, innovation, and employment generation in the twenty-first century (Saoula et al., 2023). Along with the rapid advancement of digital technology and the increasing complexity of the global economy, educational institutions are expected to prepare graduates who are capable not only of entering the labor market but also of creating employment opportunities through entrepreneurial activities. This expectation places vocational education in a strategic position because its curriculum is designed to develop practical competencies that are directly aligned with industrial and entrepreneurial needs. However, many vocational graduates continue to prioritize salaried employment rather than business creation, indicating that entrepreneurial intention remains insufficiently developed. Since entrepreneurial intention is widely recognized as the strongest predictor of future entrepreneurial behavior, strengthening entrepreneurial intention among vocational students has become an important educational objective, particularly in developing countries where youth unemployment remains a persistent challenge (Michel & Förster, 2025; Mohammed et al., 2026; Ammirato et al., 2026; Hasan et al., 2026).

Previous studies consistently demonstrate that entrepreneurial learning is one of the most influential determinants of entrepreneurial intention because it enhances entrepreneurial knowledge, opportunity recognition, business skills, and entrepreneurial confidence (Alvarez-Sánchez et al., 2026; Aprilia et al., 2026; Kenny et al., 2026). Meta-analytic evidence further confirms its positive contribution to entrepreneurial competencies across different educational settings (Li et al., 2024; Saoula et al., 2023). Nevertheless, previous

studies have primarily emphasized the direct effect of entrepreneurial learning while providing limited explanation regarding the educational conditions that enhance its effectiveness. Entrepreneurship education implemented through conventional and teacher-centered approaches often fails to provide authentic entrepreneurial experiences that effectively stimulate students' entrepreneurial aspirations. This indicates that the effectiveness of entrepreneurial learning is likely influenced by other educational factors that remain insufficiently investigated.

Among these factors, teacher support has received increasing attention because teachers function not only as instructors but also as mentors, facilitators, and role models throughout the entrepreneurial learning process. According to Social Cognitive Theory, support from significant social agents strengthens students' self-beliefs, learning motivation, and behavioral intentions (Li et al., 2024). Empirical evidence shows that teacher support positively influences entrepreneurial self-efficacy, learning engagement, and entrepreneurial intention (Dahri et al., 2024; Castro et al., 2025; Fawaid et al., 2022). Likewise, self-regulated learning enables students to plan, monitor, and evaluate their own learning activities, thereby fostering persistence, initiative, and adaptive problem-solving that are essential for entrepreneurship (Zimmerman, 2008). Previous studies have reported positive associations between self-regulated learning, academic achievement, innovation capability, and entrepreneurial competencies (Amoozegar et al., 2024; Miao & Ma, 2023). However, evidence regarding the direct contribution of self-regulated learning to entrepreneurial intention among vocational students remains inconsistent, suggesting that its role may depend on other learning mechanisms or contextual factors (Maheshwari et al., 2023; Otache et al., 2024).

Although entrepreneurial learning, teacher support, and self-regulated learning have been widely investigated, important limitations remain in the existing literature. Previous studies have generally examined these variables separately, resulting in a limited understanding of how they interact within a comprehensive framework to shape entrepreneurial intention. Evidence regarding the mechanisms through which teacher support enhances entrepreneurial intention is also inconsistent, particularly concerning the mediating roles of entrepreneurial learning and self-regulated learning. In addition, most empirical studies have been conducted in higher education settings, whereas vocational high schools have received relatively little attention despite their primary mission of preparing students for both employment and entrepreneurship (Chandler, 2026; Liu & Ye, 2025). These limitations indicate the need for an integrated explanatory model that clarifies how educational support and learning processes jointly contribute to the development of entrepreneurial intention among vocational students.

Addressing these gaps, this study develops and empirically tests an integrated structural model examining the relationships among teacher support, entrepreneurial learning, self-regulated learning, and entrepreneurial intention among vocational high school students in Indonesia. Specifically, this study investigates both direct and indirect relationships by positioning entrepreneurial learning and self-regulated learning as mediating mechanisms through which teacher support influences entrepreneurial intention (Mejeh & Held, 2022). The novelty of this study lies in integrating educational, social, and self-regulatory perspectives within a single structural model while simultaneously examining multiple mediation pathways in the context of Indonesian public vocational schools, a setting that remains underrepresented in entrepreneurship education research. The findings are expected to enrich the theoretical understanding of entrepreneurial intention development and provide evidence-based recommendations for designing entrepreneurship education that effectively strengthens entrepreneurial aspirations among vocational students.

Method

This study employed a quantitative associative causal design to examine the relationships among entrepreneurial learning, teacher support, self-regulated learning, and entrepreneurial intention. The research was conducted in nine public vocational high schools in Pesisir Selatan Regency, Indonesia, during the even semester of the 2025/2026 academic year. The target population comprised all Grade XI students who had completed or were enrolled in entrepreneurship courses, totaling 1,243 students. The required sample size was determined using the Slovin formula with a 5% margin of error, resulting in 303 respondents. A proportional random sampling technique was applied to ensure that each school was represented according to its population size. Student lists obtained from each school served as the sampling frame, after which respondents were randomly selected within each school proportion. This procedure ensured that the sample adequately represented the distribution of vocational students across the participating schools.

The study included three exogenous variables entrepreneurial learning, teacher support, and self-regulated learning and one endogenous variable, entrepreneurial intention. The measurement instrument was developed by adapting validated scales from previous entrepreneurship and educational research, with all items modified

to suit the vocational high school context. Entrepreneurial learning was measured through students' perceptions of entrepreneurial knowledge, practical skills, opportunity recognition, and entrepreneurial attitudes. Teacher support assessed instrumental, emotional, informational, and evaluative support provided during entrepreneurship learning. Self-regulated learning measured students' abilities to plan, monitor, regulate, and evaluate their own learning processes, while entrepreneurial intention measured students' willingness and commitment to pursue entrepreneurial careers. The questionnaire consisted of 42 items measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Before the main survey, the instrument was reviewed by experts in entrepreneurship education and educational measurement and was pilot-tested to ensure clarity and content validity. Documentation was also collected to obtain supporting information regarding student enrollment, school profiles, entrepreneurship curricula, and entrepreneurship programs.

Data were analyzed using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software. PLS-SEM was selected because the study aimed to simultaneously examine multiple direct and indirect relationships among latent constructs and evaluate a mediation model without requiring multivariate normality assumptions. Prior to structural analysis, common method bias was assessed using the full collinearity approach, while multicollinearity among constructs was examined using Variance Inflation Factor (VIF) values. The measurement model was evaluated through indicator loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), discriminant validity using the Heterotrait–Monotrait ratio (HTMT), and cross-loadings. The structural model was subsequently assessed using the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and standardized root mean square residual (SRMR) to evaluate explanatory and predictive capability. Hypothesis testing was performed using the bootstrapping procedure with 5,000 resamples, and relationships were considered significant when the t-value exceeded 1.96 and the p-value was below 0.05. This analytical procedure enabled comprehensive evaluation of both direct and mediating relationships among the study variables.

Results and Discussions

This study involved 303 Grade XI vocational high school students from nine public vocational schools in Pesisir Selatan Regency, Indonesia. The analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships among entrepreneurial learning, teacher support, self-regulated learning, and entrepreneurial intention. The results section presents the respondents' characteristics, descriptive findings of each construct, evaluation of the measurement model (outer model), evaluation of the structural model (inner model), and hypothesis testing, including direct and indirect effects. Overall, the findings indicate that although students reported relatively low levels of entrepreneurial learning, teacher support, self-regulated learning, and entrepreneurial intention, the structural model demonstrated significant relationships among the investigated variables.

Table 1. Distribution of Respondents by School

No.	School	Population	Sample
1	SMKN 1 Koto XI Tarusan	174	42
2	SMKN 1 Painan	252	61
3	SMKN 2 Painan	129	31
4	SMKN 1 Sutera	175	43
5	SMKN 1 Ranah Pesisir	153	37
6	SMKN 1 Linggo Sari Baganti	162	40
7	SMKN 1 Pancung Soal	102	25
8	SMKN 1 Ranah Ampek Hulu Tapan	75	18
9	SMKN 1 Silaut	21	6
Total		1,243	303

Table 1 shows that the study involved 303 students selected proportionally from a population of 1,243 students across nine public vocational schools in Pesisir Selatan Regency. The largest proportion of respondents came from SMKN 1 Painan (61 students; 20.13%), followed by SMKN 1 Sutera (43 students; 14.18%), while SMKN 1 Silaut contributed the smallest proportion (6 students; 1.98%). The proportional sampling technique ensured that the sample adequately represented the distribution of students across vocational schools in the regency.

Table 2. Descriptive Statistics of Research Variables

Variable	TCR Range (%)	Category
Entrepreneurial Learning	81.65 - 86.53	Good to Excellent
Teacher Support	84.16 - 85.68	Good to Excellent
Self-Regulated Learning	84.03 - 86.73	Good to Excellent
Entrepreneurial Intention	82.51 - 89.31	Good to Excellent

Descriptive analysis revealed that all research variables were assessed well by students. Entrepreneurship learning recorded a TCR value ranging from 81.65% to 86.53%, indicating that knowledge skills, practical skills, and entrepreneurial attitudes were good. Teacher support showed a high score (84.16%-85.68%) indicating that students felt adequate instrumental, emotional, informational, and evaluative support from teachers. Similarly, self-directed learning showed good levels across all dimensions, with TCR values ranging from 84.03% to 86.73%. Entrepreneurial intentions are also good, with a TCR of 82.51% to 89.31%. These findings show that vocational students already have the knowledge, a supportive environment to increase entrepreneurial interest.

Table 3. Discriminant Validity Assessment (HTMT)

Constructs	HTMT Value
Teacher Support to Entrepreneurial Intention	0.776
Teacher Support to Entrepreneurial Learning	0.788
Teacher Support to Self-Regulated Learning	0.824
Entrepreneurial Intention to Entrepreneurial Learning	0.877
Entrepreneurial Intention to Self-Regulated Learning	0.765
Entrepreneurial Learning to Self-Regulated Learning	0.811

As presented in Table 3, all HTMT values are below the recommended threshold of 0.90, ranging from 0.765 to 0.877. The highest HTMT value was observed between entrepreneurial intention and entrepreneurial learning (0.877), while the lowest value occurred between entrepreneurial intention and independent learning (0.765). These results demonstrate the satisfactory validity of discrimination, showing that each construct represents a conceptually different dimension and adequately measures different phenomena in the proposed model.

Table 4. Reliability and Convergent Validity of Constructs

Construct	Cronbach's Alpha	Composite Reliability	AVE
Teacher Support	0.859	0.861	0.504
Entrepreneurial Intention	0.861	0.865	0.508
Entrepreneurial Learning	0.867	0.868	0.518
Self-Regulated Learning	0.925	0.925	0.471

Table 4 shows that all constructions show satisfactory reliability, with Alpha Cronbach values ranging from 0.859 to 0.925 and Composite Reliability values ranging from 0.861 to 0.925. Entrepreneurial learning showed the highest AVE (0.518), followed by entrepreneurial intent (0.508) and teacher support (0.504). Although self-directed learning showed AVE slightly below the recommended threshold (0.471), its very high reliability coefficient suggests that the construct remains acceptable for further analysis. Overall, the measurement model meets the reliability and validity requirements of PLS-SEM convergence.

Table 5. Coefficient of Determination (R^2)

Endogenous Variable	R^2	Adjusted R^2
Entrepreneurial Intention	0.636	0.633
Entrepreneurial Learning	0.467	0.465
Self-Regulated Learning	0.636	0.634

The analysis of the determination coefficient shows the moderate to substantial explanatory strength of the structural model. Entrepreneurial intent reached a value of R^2 0.636, indicating that 63.6% of the variance was explained by teacher support, entrepreneurial learning, and independent learning. Similarly, independent learning obtained a value of R^2 0.636, indicating that 63.6% of the variance was explained by teacher support and entrepreneurial learning. Entrepreneurial learning showed moderate explanatory strength (R^2 = 0.467), suggesting that almost half of the variance was explained by teacher support. These findings suggest that the proposed model adequately describes students' entrepreneurial intentions and learning behaviors. Nilai R^2 telah dilaporkan, tetapi kemampuan prediksi model belum didukung oleh indikator lain seperti SRMR atau Q^2.

Table 6. Direct Effects and Hypothesis Testing

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	Entrepreneurial Learning to Entrepreneurial Intention	0.497	7.360	0.000	Supported
H2	Teacher Support to Entrepreneurial Intention	0.211	2.725	0.006	Supported
H3	Self-Regulated Learning to Entrepreneurial Intention	0.168	1.895	0.058	Not Supported
H4	Teacher Support to Entrepreneurial Learning	0.683	19.055	0.000	Supported
H5	Teacher Support to Self-Regulated Learning	0.453	6.387	0.000	Supported
H6	Entrepreneurial Learning to Self-Regulated Learning	0.416	6.583	0.000	Supported

Table 6 shows that 5 of the 6 direct hypotheses are statistically significant. Entrepreneurial learning had the strongest direct effect on entrepreneurial intention (β = 0.497, t = 7.360, p = 0.000), suggesting that improvements in entrepreneurship education substantially increased students' entrepreneurial intentions. Teacher support also had a positive effect on entrepreneurial intentions (β = 0.211, p = 0.006). In addition, teacher support significantly improved students' self-directed learning (β = 0.453, p = 0.000), while entrepreneurial learning contributed positively to self-regulated learning (β = 0.416, p = 0.000). These findings highlight the central role of teachers and entrepreneurship education in fostering independent learning and entrepreneurial aspirations among vocational students.

Table 7. Indirect Effects and Mediation Testing

Hypothesis	Mediation Path	β	t-value	p-value	Decision
H7	Teacher Support to Entrepreneurial Learning to Entrepreneurial Intention	0.339	6.318	0.000	Supported
H8	Entrepreneurial Learning to Self-Regulated Learning to Entrepreneurial Intention	0.070	1.820	0.069	Not Supported
H9	Teacher Support to Self-Regulated Learning to Entrepreneurial Intention	0.076	1.657	0.098	Not Supported

Mediation analysis revealed mixed findings. Entrepreneurship learning significantly mediated the relationship between teacher support and entrepreneurial intention (β = 0.339, t = 6.318, p = 0.000), suggesting that supportive teachers increased entrepreneurial intention primarily by improving the quality of entrepreneurship education. Self-paced learning is known to not significantly mediate the relationship between entrepreneurial learning and entrepreneurial intention (β = 0.070, t = 1.820, p = 0.069), suggesting *that Self-Regulated Learning* does not have a significant mediating role in this research model. These findings indicate that other factors may play a greater role in linking entrepreneurial learning to students' entrepreneurial interests. Furthermore, self-directed learning also did not significantly mediate the relationship between teacher support and entrepreneurial intention (β = 0.076, t = 1.657, p = 0.098). Therefore, the H7 hypothesis is accepted, while H8 and H9 are rejected. Overall, the findings suggest that entrepreneurial learning serves as the most influential mediation mechanism that connects teacher support and student entrepreneurial intention.

The findings indicate that entrepreneurial learning is the strongest predictor of entrepreneurial intention among vocational students (β = 0.497, t = 7.360, p = 0.000). This result suggests that entrepreneurial intention develops through meaningful learning experiences that enhance entrepreneurial knowledge, practical skills, opportunity recognition, and confidence in starting a business. In line with Human Capital Theory, entrepreneurship education strengthens competencies that support entrepreneurial decision-making and future business creation. Therefore, experiential and practice-oriented entrepreneurship learning is more effective than

theoretical instruction in fostering entrepreneurial intention. These findings are consistent with previous studies reporting that entrepreneurship learning positively influences entrepreneurial intention by improving entrepreneurial competence and attitudes (Rosniawati & Yunizar, 2025; Zhang et al., 2022; Febyanti et al., 2022).

Teacher support also had a positive and significant effect on entrepreneurial intention ($\beta = 0.211$, $t = 2.725$, $p = 0.006$), although its influence was weaker than entrepreneurial learning. This finding indicates that teachers primarily facilitate entrepreneurial intention by creating supportive learning environments through mentoring, feedback, and authentic learning experiences rather than through direct motivational influence. Consistent with Social Cognitive Theory, supportive interactions strengthen students' confidence and encourage entrepreneurial career aspirations. Accordingly, improving teachers' competence in delivering experiential entrepreneurship education is essential for strengthening students' entrepreneurial intention (Castro et al., 2025; Fawaid et al., 2022).

Self-regulated learning showed a positive but non-significant relationship with entrepreneurial intention ($\beta = 0.168$, $t = 1.895$, $p = 0.058$). This finding suggests that self-regulated learning alone is insufficient to directly encourage entrepreneurial intention because entrepreneurial aspirations are shaped by broader educational and environmental factors. Although self-regulated learning promotes students' ability to manage their own learning, its contribution to entrepreneurial intention appears to depend on entrepreneurial knowledge, opportunity recognition, and contextual support. This interpretation is supported by previous studies showing that entrepreneurial intention is influenced by entrepreneurial self-efficacy, external support, and entrepreneurial learning experiences rather than by self-regulation alone (Maheshwari et al., 2023; Otache et al., 2024).

The structural model further demonstrated that teacher support strongly enhanced entrepreneurial learning ($\beta = 0.683$, $t = 19.055$, $p = 0.000$) and self-regulated learning ($\beta = 0.453$, $t = 6.387$, $p = 0.000$). These findings highlight teachers as key contributors to the quality of entrepreneurship education by providing guidance, collaboration, and constructive feedback that encourage active learning and student autonomy. Consistent with Self-Determination Theory, supportive learning environments strengthen competence, autonomy, and intrinsic motivation, thereby improving entrepreneurial learning outcomes. Previous studies similarly reported that supportive teachers promote entrepreneurial competence and self-regulated learning through positive educational environments (Alka & Suresh, 2026; Bernadó & Wrobel, 2026; Bernal-Guerrero & Cárdenas-Gutiérrez, 2026; Mirahmadi et al., 2025).

The mediation analysis revealed that entrepreneurial learning significantly mediated the relationship between teacher support and entrepreneurial intention ($\beta = 0.339$, $t = 6.318$, $p = 0.000$), indicating that teacher support is most effective when translated into high-quality entrepreneurial learning. In contrast, self-regulated learning did not significantly mediate either the relationship between entrepreneurial learning and entrepreneurial intention ($\beta = 0.070$, $t = 1.820$, $p = 0.069$) or teacher support and entrepreneurial intention ($\beta = 0.076$, $t = 1.657$, $p = 0.098$), suggesting that learning autonomy alone cannot transform entrepreneurial learning into entrepreneurial aspirations. These findings support previous studies emphasizing that the effectiveness of entrepreneurship education depends on educational, institutional, and contextual factors (Fayolle & Linan, 2014; Oosterbeek et al., 2010). Furthermore, the model explained 63.6% of the variance in entrepreneurial intention ($R^2 = 0.636$), indicating substantial explanatory power while suggesting that additional variables, such as entrepreneurial self-efficacy, family entrepreneurial background, entrepreneurial ecosystem support, and socioeconomic conditions, should be considered in future studies (Asuyama, 2026; Keshmiri, 2025; Stuart & Moulay, 2026; Parmar et al., 2026).

Conclusions

This study concludes that entrepreneurial learning and teacher support significantly and positively influence vocational students' entrepreneurial intention. Among these variables, entrepreneurial learning emerged as the strongest predictor of entrepreneurial intention. Teacher support not only directly increased entrepreneurial intention but also significantly enhanced entrepreneurial learning and self-regulated learning. Furthermore, entrepreneurial learning served as important mediating mechanisms, particularly in explaining how teacher support contributes to the development of entrepreneurial intention. However, self-regulated learning did not significantly mediate the relationship between entrepreneurial learning and entrepreneurial intention, and teacher support and entrepreneurial intention. Overall, the findings emphasize that strengthening entrepreneurship education, providing multidimensional teacher support, and fostering students' self-regulated learning competencies are essential strategies for promoting entrepreneurial intentions among vocational high school students.

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