

Entrepreneurship Education, Entrepreneurial Competence, Business Strategy, and Technology Access as Determinants of MSME Success in West Nusa Tenggara, Indonesia

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Abstract: Micro, small, and medium enterprises (MSMEs) play a strategic role in fostering employment, economic growth, and community welfare. However, many MSMEs in developing regions continue to face challenges related to limited entrepreneurial education, insufficient competence, weak business strategies, and suboptimal utilization of technology. This study aims to analyze the influence of entrepreneurship education, entrepreneurial competence, business strategy, and technology access on MSME success in West Nusa Tenggara, Indonesia. This research applied a quantitative explanatory survey design with a total sample of 204 MSME owners selected through simple random sampling. Data were collected through questionnaires and Google Forms and analyzed using multiple linear regression. Findings reveal that entrepreneurship education, competence, business strategy, and technology access significantly and positively affect MSME success, both partially and simultaneously. These results highlight the importance of strengthening human capital development, strategic orientation, and digital adoption to improve MSME performance and sustainability. The study contributes to the growing literature on MSME development and provides practical insights for policymakers and business practitioners to formulate effective empowerment strategies.

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Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a fundamental role in advancing social welfare, economic resilience, and sustainable development across both developed and developing nations. They contribute significantly to employment creation, poverty alleviation, income distribution, innovation, and economic diversification, particularly in emerging economies where large-scale industries are often limited. In Indonesia, MSMEs account for more than 60 percent of the national Gross Domestic Product (GDP) and absorb more than 97 percent of the national workforce, positioning this sector as the backbone of national economic stability and growth. A similar condition

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can be observed in West Nusa Tenggara (NTB), where MSMEs function not only as a primary source of livelihood but also as strategic drivers of regional economic development. However, despite their impressive quantitative growth, many MSMEs continue to struggle in achieving sustainable success due to institutional, managerial, strategic, and technological barriers.

In this regard, entrepreneurship education has emerged as a strategic instrument capable of enhancing entrepreneurial readiness, competence development, and business sustainability. Entrepreneurship education goes beyond theoretical learning; it fosters entrepreneurial mindset, opportunity recognition capability, innovation, resilience, decision-making competence, and willingness to take calculated risks. Evidence from international studies suggests that entrepreneurship education significantly contributes to building entrepreneurial orientation, strengthening business capacity, and improving enterprise performance (He et al., 2024; Li et al., 2025; Rongpipi & Sharma, 2024). Similarly, entrepreneurship education is argued to enhance creativity, adaptability, and problem-solving skills, which are critical in highly dynamic economic environments, particularly in the digital economy era (Fahrurrozi, 2025; Li et al., 2023; Okorokov et al., 2019). However, in many developing regions, including West Nusa Tenggara, entrepreneurship education often remains inaccessible, fragmented, or insufficiently contextualized to the real needs of MSME actors. This gap raises important questions regarding how effectively entrepreneurship education can support MSME success in regions with limited resources, institutional support, and technological infrastructure.

Beyond entrepreneurship education, entrepreneurial competence constitutes another vital determinant of MSME success. Entrepreneurial competence encompasses a set of abilities including managerial capability, strategic thinking, technical proficiency, opportunity sensing, communication, leadership, and innovation capacity. Competent entrepreneurs are more capable of managing business complexities, responding effectively to environmental uncertainty, and leveraging available resources to gain competitive advantage. Prior empirical evidence demonstrates that entrepreneurial competence is positively associated with enterprise performance, competitiveness, and sustainability (Bhati et al., 2025; Li et al., 2025). Entrepreneurs with strong competencies are more likely to navigate uncertainties, create strategic opportunities, and strengthen their business positioning within increasingly competitive markets. Therefore, entrepreneurial competence serves not only as an operational asset but also as a strategic capital for business sustainability.

Equally important is the role of business strategy, which provides direction, structure, and coherence for business operations. A well-designed business strategy enables MSMEs to define their market focus, identify competitive positioning, determine differentiation strategies, allocate resources effectively, and formulate long-term development objectives. Without an appropriate strategic orientation, MSMEs risk stagnation, inefficiency, and failure in highly competitive environments. Strategic management literature consistently emphasizes that the implementation of appropriate business strategies is closely related to organizational performance, competitive advantage, and long-term sustainability (Beigi et al., 2026; Knezović & Hamur, 2022; Mbombo et al., 2025; Timotius, 2023). This underscores the importance of strategic capability not only as an operational necessity but also as a determinant of resilience in volatile and uncertain markets. However, many MSMEs, particularly in developing regions, still lack structured strategic planning due to limited knowledge, experience, and professional support.

The rapid advancement of the digital economy further highlights the crucial importance of technology access for MSME success. Technology enables MSMEs to streamline operations,

enhance productivity, reduce transaction costs, expand market reach, improve marketing effectiveness, strengthen customer engagement, and participate in global value chains. Digital platforms and technological tools have transformed traditional business practices, creating new opportunities for innovation, competitiveness, and inclusive growth. Nevertheless, many MSMEs in emerging regions continue to face technological limitations due to digital illiteracy, inadequate infrastructure, financial constraints, and lack of institutional support. These limitations hinder their ability to fully benefit from digital transformation (Da Costa et al., 2022; Matsieli & Mutula, 2025; Panjaitan et al., 2025). Consequently, technology access becomes not merely a supporting factor but a critical determinant of business success in the contemporary economic landscape.

While numerous studies have examined the effects of entrepreneurship education, entrepreneurial competence, business strategy, and technology on MSME performance, most existing research treats these variables in isolation or only explores limited interrelationships. Many studies have predominantly focused on single determinants such as education, competence, or technology without integrating them into a comprehensive analytical framework. Furthermore, a significant proportion of previous research has been conducted in urban regions or advanced economies with strong technological ecosystems, thereby limiting the representativeness of findings for developing or peripheral areas. However, previous studies have not yet discussed comprehensively the simultaneous interaction of entrepreneurship education, entrepreneurial competence, business strategy, and technology access in shaping MSME success within developing regional contexts such as West Nusa Tenggara, Indonesia. This gap provides a substantial opportunity to construct a more holistic understanding of how these critical factors collectively influence MSME success.

Moreover, existing literature still lacks region-specific empirical evidence that reflects the socio-economic realities, digital readiness, institutional dynamics, and structural challenges of MSMEs in less developed regions. West Nusa Tenggara represents a unique socio-economic context with increasing MSME growth yet facing persistent structural limitations. Therefore, context-sensitive empirical investigation is urgently needed to provide grounded insights that are both academically relevant and practically meaningful.

Therefore, this study aims to analyze the influence of entrepreneurship education, entrepreneurial competence, business strategy, and technology access on the success of MSMEs in West Nusa Tenggara, Indonesia, both individually and collectively. This research is expected to contribute theoretically by enriching entrepreneurship and strategic management literature through a more integrated analytical framework. At the same time, it provides practical implications for policymakers, educational institutions, MSME development agencies, and MSME practitioners in designing comprehensive empowerment strategies that integrate education, competence development, strategic planning, and technological capability enhancement.

Research Method

This study adopted a quantitative explanatory research design to empirically examine the causal relationship between entrepreneurship education, entrepreneurial competence, business strategy, technology access, and the success of Micro, Small, and Medium Enterprises (MSMEs) in West Nusa Tenggara, Indonesia. A cross-sectional survey approach was employed, allowing data to be collected from respondents at a single point in time. The population of this research comprised all registered MSMEs in West Nusa Tenggara, totaling more than 324,000 business units. Considering the magnitude of the population, a sampling process was implemented using a simple random

sampling technique to ensure equal opportunity for all MSME actors to become respondents. The determination of sample size applied the Slovin formula with a 7% margin of error, resulting in a final sample of 204 MSME owners or managers who met the predetermined criteria, including having operated their business for at least one year, being officially registered as active MSMEs, and expressing voluntary willingness to participate in the study. Data were collected using a structured questionnaire distributed both online (via Google Forms) and offline to reach respondents located across various regions.

The questionnaire consisted of several sections, including demographic information, entrepreneurship education, entrepreneurial competence, business strategy, technology access, and MSME success. All variables were operationalized using a Likert scale ranging from strongly disagree (1) to strongly agree (5). The measurement items were adapted from established and validated instruments in previous reputable research to ensure construct relevance and theoretical alignment. Prior to full-scale distribution, the instrument underwent expert validation to assess content adequacy and linguistic clarity, followed by a pilot test involving 30 MSME respondents to identify potential weaknesses and ensure instrument reliability. The validity of the instrument was tested using Pearson Product Moment correlation, and all indicators demonstrated significant correlation coefficients ($p < 0.05$), confirming acceptable construct validity. Reliability analysis using Cronbach's Alpha revealed coefficient values above 0.70 for all variables, indicating a high level of internal consistency.

Data collection was carried out for approximately one month through coordination with local MSME institutions and relevant authorities. Respondents were approached through registered MSME networks, business groups, and entrepreneurship communities. The research strictly adhered to ethical research principles; participation was entirely voluntary, informed consent was obtained prior to data collection, personal confidentiality and anonymity were guaranteed, and data were utilized solely for academic purposes. Only fully completed questionnaires were included in the final dataset to maintain data integrity and analytical rigor.

The collected data were processed using statistical software. Descriptive statistics were first employed to summarize respondent characteristics and provide an overview of variable distributions. Before conducting hypothesis testing, classical assumption tests were performed to ensure data suitability for regression analysis, including normality, multicollinearity, heteroscedasticity, and linearity tests. To analyze the relationship among variables, multiple linear regression analysis was applied. The partial influence of each independent variable entrepreneurship education, entrepreneurial competence, business strategy, and technology access on MSME success was examined using the t-test, whereas the simultaneous influence of all independent variables was tested using the F-test. The coefficient of determination (R^2) was used to evaluate the explanatory power of the model in predicting MSME success. A significance level of $\alpha = 0.05$ was applied throughout the analysis. Through this methodological approach, the study ensured methodological rigor, reliability, and validity, thereby generating credible empirical evidence regarding the determinants of MSME success in West Nusa Tenggara.

Result and Discussion

Result

This section presents the empirical findings of the study, including the results of assumption testing, multiple regression analysis, the coefficient of determination, partial (t-test) analysis, and simultaneous (F-test) analysis.

Assumption Testing Results

Normality Test

The Kolmogorov Smirnov test was employed to examine the normality of the residual distribution. The result shows an Asymp. Sig value of **0.082**, which is greater than 0.05, indicating that the data are normally distributed.

Table 1. Normality Test

Variable	Asymp. Sig (2-tailed)	Criterion	Conclusion
Unstandardized Residual	0.082	> 0.05	Normal Distribution

Linearity Test

Linearity testing revealed that all independent variables have Sig. Deviation from Linearity values greater than 0.05, indicating that each independent variable has a linear relationship with MSME success.

Table 2. Linearity Test

Variable	Sig. Deviation from Linearity	Criterion	Conclusion
Entrepreneurship Education	0.255	> 0.05	Linear
Entrepreneurial Competence	0.218	> 0.05	Linear
Business Strategy	0.685	> 0.05	Linear
Technology Access	0.274	> 0.05	Linear

Multicollinearity Test

The results show that all tolerance values exceed 0.10 and all VIF values are below 10, indicating that no multicollinearity exists among the independent variables.

Table 3. Multicollinearity Test

Variable	Tolerance	VIF	Conclusion
Entrepreneurship Education	0.982	1.018	No Multicollinearity
Entrepreneurial Competence	0.987	1.013	No Multicollinearity
Business Strategy	0.981	1.019	No Multicollinearity
Technology Access	0.968	1.033	No Multicollinearity

Heteroscedasticity Test

The Glejser test was conducted to assess heteroscedasticity. The results show that all significance values are greater than 0.05; therefore, heteroscedasticity is not detected in the model.

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Table 4. Heteroscedasticity Test

Variable	Sig.	Conclusion
Entrepreneurship Education	0.460	No Heteroscedasticity
Entrepreneurial Competence	0.184	No Heteroscedasticity
Business Strategy	0.050	No Heteroscedasticity
Technology Access	0.641	No Heteroscedasticity

Based on these results, the regression model satisfies all classical assumption requirements and is suitable for further analysis.

Multiple Linear Regression Results

The multiple regression analysis indicates that all independent variables significantly influence MSME success. The regression equation is as follows:

Table 5. Multiple Linear Regression

Variable	B	t-value	Sig.	Remark
Entrepreneurship Education (X1)	0.325	10.615	0.000	Significant
Entrepreneurial Competence (X2)	0.325	9.171	0.000	Significant
Business Strategy (X3)	0.182	6.122	0.000	Significant
Technology Access (X4)	0.247	8.465	0.000	Significant

All independent variables demonstrate positive and statistically significant effects on MSME success (Sig < 0.05).

Coefficient of Determination (R²)

The coefficient of determination (R²) is **0.636**, indicating that 63.6% of the variance in MSME success is explained by entrepreneurship education, entrepreneurial competence, business strategy, and technology access simultaneously. The remaining 36.4% is attributed to other factors not included in the model.

Table 6. Coefficient of Determination (R²)

Indicator	Value
R Square	0.636
Interpretation	63.6% explanatory power

Partial Test Results (t-Test)

The t-test results demonstrate that each independent variable significantly influences MSME success individually, as all significance values are below 0.05.

Table 7. Partial Test Results (t-Test)

Variable	t-value	Sig.	Conclusion
Entrepreneurship Education	10.615	0.000	Significant
Entrepreneurial Competence	9.171	0.000	Significant
Business Strategy	6.122	0.000	Significant
Technology Access	8.465	0.000	Significant

Simultaneous Test Results (F-Test)

The F-test result indicates an F-value of **87.033** with a significance level of **0.000**, which is less than 0.05. This confirms that entrepreneurship education, entrepreneurial competence, business strategy, and technology access collectively have a significant effect on MSME success.

Table 7. Simultaneous Test Results (F-Test)

Indicator	Value	Conclusion
F-value	87.033	Significant
Sig.	0.000	Simultaneous Effect Confirmed

Discussion

The findings of this study indicate that entrepreneurship education, entrepreneurial competence, business strategy, and technology access significantly and positively influence MSME success, both individually and collectively. These results reinforce the view that MSME performance is strongly determined by the quality of human capital, the capacity to formulate effective strategies, and the ability to adopt technology in business operations.

First, the study reveals that entrepreneurship education has a significant positive effect on MSME success. This suggests that exposure to entrepreneurial learning through formal education, training programs, or workshops enhances knowledge, attitudes, and skills that are essential for business sustainability. Entrepreneurship education fosters opportunity recognition, creativity, risk management capability, problem-solving capacity, and strategic thinking, all of which contribute to improved business performance. These findings are consistent with previous studies that highlight the role of entrepreneurship education in strengthening entrepreneurial orientation and improving enterprise growth and resilience (Fox, Pittaway, & Uzuegbunam, 2021; Sitaridis & Kitsios, 2024). Thus, the results confirm that entrepreneurship education is not merely supplementary but represents a fundamental foundation for MSME development, particularly in emerging regions.

Second, the results demonstrate that entrepreneurial competence significantly influences MSME success. Entrepreneurs who possess strong managerial, technical, strategic, and interpersonal skills are more capable of managing uncertainty, adapting to changes, optimizing resources, and sustaining competitive advantage. Competence enables entrepreneurs to design better business decisions, respond effectively to environmental challenges, and explore new opportunities for growth. These results align with empirical evidence suggesting that entrepreneurial competence is a critical determinant of business performance and sustainability (Wongso, Gana, & Kerihi, 2020). In the context of West Nusa Tenggara, where business competition and structural challenges remain high, competence serves as strategic capital that strengthens business endurance and success.

Third, the study confirms that business strategy has a significant positive effect on MSME success, although its influence is slightly lower compared with other variables. This indicates that structured strategic planning such as defining market positioning, creating product differentiation, managing competitive risks, and aligning resources with business objectives remains essential for enhancing MSME performance. A well-formulated strategy provides direction, clarity, and long-term orientation for business operations. These findings are in line with strategic management literature asserting that an effective business strategy is strongly associated with enhanced organizational performance, competitive positioning, and business continuity (Ahmad, Halim, & Zainal, 2018).

Therefore, while competence and education play foundational roles, strategic capability ensures that business execution remains coherent and sustainable.

Fourth, the findings reveal that technology access significantly contributes to MSME success. Technology enables MSMEs to operate more efficiently, expand market reach, improve customer interaction, reduce operational costs, and strengthen competitiveness through digital innovation. The increasing significance of technology reflects the current digital economy demands in which businesses must be agile, adaptive, and technologically capable. This result is consistent with previous studies showing that technology adoption enhances productivity, innovation capacity, and long-term business performance (Marconatto, Barin-Cruz, & Pozzebon, 2021). In developing regions like West Nusa Tenggara, access to technology becomes even more strategic, as it bridges structural limitations and enables MSMEs to engage in broader market ecosystems.

Collectively, the simultaneous influence of entrepreneurship education, competence, strategy, and technology indicates that MSME success is shaped by an integrated interplay of knowledge, capability, strategic orientation, and digital readiness. The substantial value of the coefficient of determination demonstrates that these factors collectively explain a large proportion of MSME performance variation, emphasizing the need for holistic MSME development approaches rather than fragmented interventions. This confirms the relevance of human capital theory (Becker), strategic management theory, and digital transformation perspectives in explaining MSME success.

From a contextual standpoint, these findings are particularly important for West Nusa Tenggara, a region characterized by socio-economic diversity, resource constraints, and evolving digital infrastructure. The empirical evidence from this study provides strong justification that empowering MSMEs requires comprehensive initiatives encompassing entrepreneurial education enhancement, competency development programs, strategic mentoring, and digital technology facilitation. Such integrated empowerment frameworks are expected to increase the resilience, competitiveness, and sustainability of MSMEs in the region.

In summary, the results of this study are consistent with and enrich existing literature by presenting a comprehensive model that empirically demonstrates the simultaneous and partial influence of key entrepreneurial and strategic variables on MSME success in a developing regional context. These findings emphasize that strengthening entrepreneurship education, improving entrepreneurial competence, developing robust business strategies, and enhancing technology access are essential to achieving sustainable MSME success in West Nusa Tenggara and similar developing regions.

Conclusion

The findings of this study indicate that entrepreneurship education, entrepreneurial competence, business strategy, and technology access significantly and positively influence MSME success, both individually and collectively. This supports the view that MSME performance is strongly driven by the quality of human capital, the ability to formulate effective strategies, and readiness to adopt technology in business operations. Entrepreneurship education is proven to enhance knowledge, attitudes, opportunity recognition, creativity, risk-management capability, and strategic thinking, which ultimately improve business sustainability and competitiveness, consistent with previous studies stating that entrepreneurial education significantly strengthens entrepreneurial capability and business performance (Adeel et al., 2023). Entrepreneurial competence also plays a critical role, as entrepreneurs with strong managerial, technical, and interpersonal capabilities are better able to adapt

to change, optimize resources, and sustain competitive advantage, aligning with empirical evidence that entrepreneurial competence is a key determinant of SME performance and sustainability (Emerald Publishing). Furthermore, business strategy contributes significantly to MSME success, where structured strategy, clear market positioning, and competitive orientation are associated with improved organizational performance and long-term continuity (Farida & Setiawan, 2022). Meanwhile, access to technology enhances operational efficiency, expands market access, strengthens innovation capability, and improves competitiveness, in line with research confirming that digital technology adoption significantly boosts SME productivity and business outcomes (Faiz et al., 2024). Collectively, these findings confirm that MSME success is shaped by the integration of entrepreneurial education, competence, strategic orientation, and digital readiness, emphasizing the importance of holistic empowerment approaches rather than fragmented interventions.

Recommendation

Based on the findings of this study, several recommendations are proposed for policymakers, educational institutions, MSME support agencies, and MSME practitioners. First, it is recommended that government and regional authorities strengthen entrepreneurship education programs through structured training, continuous mentoring, and contextually relevant capacity-building initiatives. These programs should not only focus on theoretical knowledge but also emphasize practical business skills, opportunity recognition, innovation development, risk management, and problem-solving abilities tailored to the realities of MSMEs in developing regions such as West Nusa Tenggara. Second, entrepreneurial competence development should become a strategic priority. This can be achieved through competency-based workshops, managerial coaching, leadership training, and peer-learning networks that enable MSME owners to enhance their managerial, strategic, and interpersonal skills. Business incubators, universities, and private sector partners are encouraged to collaborate in designing integrated competency development frameworks to improve MSME performance and sustainability. Third, MSME actors are encouraged to adopt and implement well-structured business strategies. Relevant agencies should provide strategic guidance and mentoring related to market analysis, business planning, product differentiation, financial management, and competitive positioning. Strengthening strategic capability will help MSMEs maintain business direction, improve operational quality, and strengthen their competitive advantage. Fourth, it is crucial to expand MSME access to digital technology and digital infrastructure. Government agencies, digital platforms, and financial institutions should facilitate affordable technology access, digital literacy programs, e-commerce utilization training, and financial technology adoption. Enhancing technological readiness will enable MSMEs to increase efficiency, widen market reach, and integrate into the digital economy ecosystem. For academic and research development, future studies are recommended to utilize longitudinal designs to capture long-term effects, employ mixed-method approaches to obtain deeper insights, and extend research across broader or comparative regional contexts. Future research may also incorporate additional variables such as innovation capability, financial inclusion, institutional support, and market dynamics to provide a more comprehensive understanding of MSME success determinants. In summary, an integrated approach combining education enhancement, competency strengthening, strategic guidance, and technological empowerment is essential for advancing MSME success and supporting sustainable economic development in emerging regions.

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