Reviu Akuntansi, Manajemen, dan Bisnis (RAMBIS)
ISSN: 2797-958X, Vol 5, No 2, 2025, 579-591 https://doi.org/10.35912/rambis.v5i2.6336

Entrepreneurship Knowledge and Vocational Policy's Effect on MSMEs Business Strategy: Artificial Intelligence Moderation Analysis

Muh. Ma'ruf Idris[1*], Muh. Yushar Mustafa[2], Muh. Al Fatah Arief Putra[3]
Universitas Negeri Makassar, Makassar, Indonesia[1,2,3]
maruf.idris@unm.ac.id[1*], m.yusharmustafa@unm.ac.id[2], mualfattah@unm.ac.id[3]

Article History
Received on 27 September 2025
1st Revision 29 September 2025
2nd Revision 09 October 2025
3rd Revision 22 October 2025
Accepted on 27 October 2025

Abstract

Purpose: This study investigates 122 culinary MSME owners in Makassar, Indonesia, to examine how entrepreneurship knowledge and vocational policy influence business strategy and analyze the moderating role of Artificial Intelligence (AI) in strengthening these relationships. Despite the growing interest in MSME development, limited research integrates human capital, institutional policy, and technological capability within a single strategic framework.

Research Methodology: A quantitative approach was employed using a structured survey questionnaire distributed to MSME owners in the region. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with Smart-PLS software. To enrich the interpretation, qualitative insights were obtained through in-depth interviews with selected stakeholders. The research framework was grounded in a comprehensive review of the entrepreneurship, institutional, and digital transformation literature.

Results: The findings reveal that entrepreneurial knowledge positively and significantly influences business strategy development. Vocational policy does not have a significant direct effect on business strategy. Artificial intelligence demonstrates a significant direct effect and moderates the relationship between entrepreneurship knowledge and business strategy by strengthening innovation practices and strategic decision-making.

Conclusions: Entrepreneurial knowledge is a critical strategic resource for MSMEs. However, institutional policy support alone is insufficient without technological capabilities. AI functions as a strategic enabler that amplifies the effective utilization of entrepreneurial expertise.

Limitations: This study focuses on culinary MSMEs in Makassar, limiting the generalizability of the findings across sectors and regions.

Contributions: This study advances the MSMEs and digital transformation literature by positioning AI as a strategic moderator linking knowledge and policy to competitive strategy.

Keywords: *Artificial Intelligence, Business Strategy, Entrepreneurship Knowledge, MSMEs, Vocational Policy*

How to Cite: Idris, M.M., Mustafa, M.Y., Putra, M.A.F.A. (2025). Entrepreneurship Knowledge and Vocational Policy's Effect on MSMEs Business Strategy: Artificial Intelligence Moderation Analysis. *Reviu Akuntansi, Manajemen, dan Bisnis (RAMBIS)*. 5(2) 579-591

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) constitute the backbone of most economies, particularly in developing countries. They generate employment, stimulate innovation, and promote economic diversification (Saxena, 2025; Weldeslassie et al., 2019). Globally, MSMEs account for more than 90% of business entities and contribute approximately 60% of the total employment (Kar, 2023). Despite their economic significance, MSMEs are highly vulnerable. Structural constraints, such as limited financial access, weak managerial capability, unstable market conditions, and fragmented policy support, continue to hinder their long-term competitiveness (ASEAN & Asia, 2018; Kaufmann & Lafarre, 2021). These persistent challenges raise a central strategic problem: how can Micro, Small, and Medium Enterprises (MSMEs) formulate effective business strategies in environments characterized by institutional uncertainty and rapid technological change?

From a human capital perspective, Entrepreneurship Knowledge (EK) is widely recognised as a critical determinant of business sustainability (Nguyen, Tran, Ho, Ho, & Nguyen, 2025; Stadler, Alberton, & Smith, 2021; Zhou, Rashid, & Cheng, 2024). EK encompasses competencies in strategic thinking, financial literacy, opportunity recognition, and market analysis (Paramita, Rizal, Bahtiar Sulistyan, Taufiq, & Dimyati, 2021; Sarah & Uzochukwu, 2025). Empirical studies demonstrate that entrepreneurs with stronger knowledge bases are better able to mitigate risks and adapt to dynamic markets (Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017; Rukmana et al., 2024). Entrepreneurship education further enhances managerial and strategic capabilities (Fayolle & Gailly, 2015; Mack & Honig, 2023; Nabi et al., 2017; Rukmana et al., 2024; Sitaridis & Kitsios, 2023).

However, most prior research has linked EK directly to performance outcomes, such as profitability or growth. Far less attention has been paid to its role in shaping structured business strategies, including planning orientation, marketing configuration, and operational alignment. This reveals the first theoretical gap: the mechanism through which entrepreneurship knowledge translates into strategic formulation remains insufficiently specified. Institutional theory suggests that entrepreneurial capabilities do not operate in isolation. Vocational policies, particularly those focused on skills development, entrepreneurship training, and industry collaboration, shape the context in which MSMEs operate (Sutrisno, Permana, & Junaidi, 2023; Usman & Hamid, 2022).

Evidence indicates that vocational training can improve innovation capacity and workforce competence (Rukmana et al., 2024). However, the findings remain fragmented. Many studies assess vocational policy effectiveness at the macro level or within educational systems rather than at the firm level (Mustaffa, Tawil, Selvaratnam, Techanamurthy, & Affandi, 2024; Zhou et al., 2024). Consequently, empirical evidence on whether and how vocational policy strengthens MSME business strategies is limited (Kakava, Eta, & Shepherd, 2024). This constitutes a second gap: the interaction between institutional support and firm-level strategic capabilities remains underexplored.

Simultaneously, technological transformation, particularly the diffusion of Artificial Intelligence (AI), is redefining competitive dynamics. AI enhances predictive analytics, customer engagement, and operational efficiency (Kumar, Raut, Mangla, Ferraris, & Choubey, 2024; Singh et al., 2025). MSMEs adopting AI can leverage data-driven decision-making and optimize resource allocation (Akbar, Mustafa, et al., 2024). Prior studies have primarily positioned AI as a direct driver of performance or innovation. However, few studies have conceptualized AI as a contingent or moderating mechanism that strengthens the relationship between human capital, institutional frameworks, and strategic outcomes. This creates a third gap: the absence of an integrated framework that positions AI as a strategic amplifier, rather than merely as a technological input.

Taken together, the literature remains fragmented across three streams: entrepreneurship knowledge, vocational policy, and artificial intelligence. These streams are rarely integrated into a single analytical model. More importantly, the interactive and moderating role of AI in connecting entrepreneurial capability and institutional support to MSME business strategy has not been empirically examined in a comprehensive manner (Manan, Nursari, Sejati, Yoesseri, & Mareta, 2024; Oktaria, Raras, Alam, Barusman, & Habiburrahman, 2024; Surjanti, Mulyantomo, Triyani, & Kurniawati, 2025). This

fragmentation limits theoretical clarity regarding how internal capabilities, institutional structures, and advanced technologies jointly shape strategic development in MSMEs (Haeruddin, Natsir, Aslam, Aswar, & Mustafa, 2023).

To address these gaps, this study develops and tests an integrated model examining (1) the direct influence of entrepreneurship knowledge on MSME business strategy; (2) the effect of vocational policy on strategic formulation; and (3) the moderating role of artificial intelligence in strengthening these relationships (Kurnia, Situmorang, & Sudiyono, 2025). By synthesizing human capital theory, institutional perspectives, and technological capability within a unified framework, this study advances the literature in three ways.

First, it shifts the analytical focus from performance outcomes to strategic formation, clarifying the mechanism through which entrepreneurial knowledge influences MSME competitiveness. Second, it extends institutional theory by empirically linking vocational policy to firm-level strategic behavior, rather than macro-level indicators. Third, it reconceptualizes AI as a strategic enabler that conditions and amplifies the effects of knowledge and policy, thereby offering a more nuanced explanation of the digital transformation of MSMEs.

This study contributes to the literature both theoretically and practically. Theoretically, it bridges previously disconnected research streams and provides a multilevel explanation of MSME strategic development. Practically, it offers actionable insights for policymakers, vocational institutions, and MSME practitioners seeking to strengthen their competitiveness in increasingly digitalized and knowledge-driven markets.

2. Literature Review and Hypothesis/es Development

2.1 Literature Review

Micro, Small, and Medium Enterprises (MSMEs) are widely acknowledged as key drivers of economic development, particularly in emerging economies (ASEAN & Asia, 2018). Despite their substantial contributions to employment and productivity, MSMEs often struggle with managerial capability limitations and strategic adaptability. Consequently, scholarly attention has increasingly focused on identifying the internal and external determinants that shape MSME strategic development, rather than reiterating their macroeconomic importance.

Entrepreneurship Knowledge (EK) is recognized as a central intangible resource that influences strategic decision-making. Rooted in human capital and resource-based perspectives, EK encompasses the cognitive competencies and applied managerial skills required to identify opportunities, allocate resources, and sustain competitive positioning (Sarah & Uzochukwu, 2025). Empirical research shows that entrepreneurship education enhances opportunity recognition, innovation orientation and risk evaluation capacity (Nabi et al., 2017; Sitaridis & Kitsios, 2023). EK is commonly operationalized through knowledge of business models, financial literacy and market analysis capability (Fayolle & Gailly, 2015). While prior studies confirm its positive association with performance and growth, fewer investigations have explicitly examined its influence on structured business strategy formulation, particularly within student-led MSMEs.

From an institutional perspective, Vocational Policy SC Vetrivel, VP Arun, TP Saravanan, and R Maheswari (2024) represents a formal mechanism designed to enhance entrepreneurial skills and strengthen MSME competitiveness (Sutrisno et al., 2023; Sandhya Vetrivel, V. Arun, T. Saravanan, & Refasha Maheswari, 2024). Policy interventions focusing on training accessibility, awareness, and industry collaboration have been associated with improved innovation and workforce preparedness (Kar, 2023; Kaufmann & Lafarre, 2021). However, empirical findings regarding the direct impact of vocational policy on MSME strategic outcomes remain inconsistent. Several studies suggest that policy effectiveness depends heavily on implementation quality and contextual alignment rather than policy existence alone, indicating a potential gap between institutional support and strategic execution at the firm level.

Technological advancements, particularly Artificial Intelligence (AI), have emerged as transformative capabilities in MSME operations. AI supports predictive analytics, customer segmentation, operational automation and data-driven strategic planning (Kumar et al., 2024; Li & Islam, 2021; Singh et al., 2025). Prior research has largely examined AI as a direct determinant of performance or innovation (Akbar, Idris, et al., 2024). However, limited attention has been given to its potential moderating role in enhancing or operationalizing existing organizational resources, such as entrepreneurial knowledge and policy-supported competencies (Mumi, Ngammoh, & Suwanpakdee, 2025). Drawing from dynamic capability theory, AI may function as an enabling mechanism that amplifies the strategic value of knowledge and institutional support, rather than acting as an isolated technological factor (Campilho & Silva, 2023; Chen & Cheng, 2025).

Business strategy in MSMEs is typically conceptualized through strategic planning, marketing, and operational efficiency (Sulistyaningsih, Murti, & Ratnasih, 2024). Although extensive research has independently examined entrepreneurship knowledge, vocational policy, and digital technology adoption, few studies have integrated these three dimensions into a unified analytical framework. Specifically, empirical evidence remains limited regarding (1) how vocational policy translates into strategic outcomes at the firm level and (2) whether AI strengthens the relationship between knowledge capability, institutional support, and business strategy.

Therefore, this study addresses this gap by proposing an integrative model that positions entrepreneurship knowledge as a strategic resource, vocational policy as institutional support, and artificial intelligence as a technological moderator that shapes MSME business strategy. By examining these interactions simultaneously within the context of student-operated culinary MSMEs, this study clarifies the contingent role of technology in translating knowledge and policy into actionable strategic outcomes.

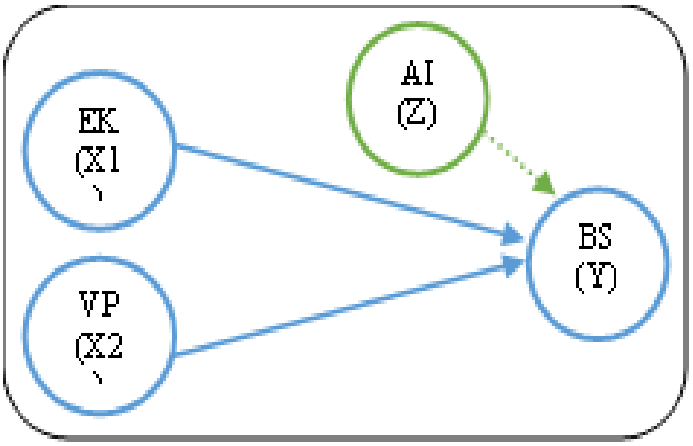

Figure 1. Conceptual framework

2.2 Hypothesis/es Development

Based on Figure 1, this study proposes several hypotheses:

H_1: Entrepreneurial knowledge has a significant positive effect on MSMEs' business strategy.
H_2: Vocational policy has a significant positive effect on MSMEs' business strategies.
H_3: Artificial intelligence has a significant positive effect on MSMEs' business strategies.
H_4: Artificial intelligence moderates the relationship between entrepreneurship knowledge and MSMEs' business strategy
H_5: Artificial intelligence moderates the relationship between vocational policy and MSMEs' business
strategy

3. Methodology

This study adopts a quantitative, survey-based research design to examine the effects of entrepreneurship knowledge, vocational policy, and artificial intelligence on the business strategy of

culinary MSMEs in Makassar, Indonesia. A quantitative approach was selected to generate measurable data in the form of numerical scores obtained through structured questionnaires, enabling statistical hypothesis testing and cautious generalization within the defined population.

Data were collected using a self-administered questionnaire distributed online and offline to eligible respondents. The instrument employed a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5) to measure all the research variables. The constructs were operationalized based on established theoretical frameworks and prior empirical studies to ensure content validity and conceptual consistency. Before full distribution, the questionnaire was reviewed for clarity and contextual relevance to culinary MSME activities to minimize response ambiguity and measurement error.

The analytical procedure consisted of a descriptive statistical analysis to describe the distribution patterns of variables and indicator frequencies (Akbar et al., 2023). In addition, classical assumption tests were conducted, including multicollinearity, heteroscedasticity, and normality tests, following the recommendations of (Mustafa, Rauf, & Killa, 2023). Statistical analyses were performed using IBM SPSS Statistics software to ensure computational accuracy and reliability. This study assumes linear relationships among variables and applies established behavioral and strategic management theories as the conceptual foundation of the structural model.

The population of this study comprises MSMEs in Makassar owned and/or operated by undergraduate students. Based on the annual report of Badan Pusat Statistik Rosaely, Mukhsin, and Nurhayati (2026), there are 160 officially registered and active MSMEs in this category. Following Sekaran and Bougie (2016), the sample size was determined to ensure adequate statistical power relative to the population size. A convenience sampling approach was employed due to practical access considerations, whereby respondents were selected based on accessibility, willingness to participate, and eligibility criteria (i.e., actively managing a culinary MSME while enrolled as an undergraduate student). Although the initial target sample was 129 respondents, 122 completed questionnaires met the data screening requirements and were included in the final analysis.

It is important to acknowledge the potential biases associated with convenience sampling. First, selection bias may have occurred because respondents who were more accessible or more engaged in entrepreneurial networks were more likely to participate. Second, self-selection bias may have arisen, as individuals with a stronger interest in entrepreneurship or digital technology may have been more willing to respond. Third, the sample's concentration on student-operated MSMEs may limit its representativeness compared to the broader MSME population in Makassar.

To mitigate these limitations, this study ensured proportional outreach across multiple universities and culinary business clusters, applied clear inclusion criteria, and conducted data screening to remove incomplete or inconsistent responses. Nevertheless, the findings should be interpreted within the context of these sampling constraints, and generalization beyond similar demographic and geographical settings should be undertaken with caution. A detailed description of the research design, sampling procedure, measurement scale, and statistical testing enhances transparency and supports the replicability of the study under comparable contextual conditions.

4. Results and Discussions

4.1 Research Results

4.1.1 Descriptive Analysis Test

Table 1. Characteristics of respondent's test result

Characteristics	Category	Frequency	%
Age	18 to 20	30	24.6
	21 to 23	92	75.4
Gender	Male	50	41.0
	Female	72	59.0

Based on Table 1, the demographic profile indicates that 75.4% of respondents are aged 21-23 years, while 24.6% are 18-20 years old. This concentration in the older youth cohort aligns with studies on youth entrepreneurship, which argue that entrepreneurial intention and execution tend to increase with age due to higher cognitive maturity, social exposure, and accumulated human capital. Previous research on student entrepreneurs suggests that individuals in their early twenties demonstrate stronger strategic awareness and risk assessment capabilities than late adolescents.

The gender distribution (59% female; 41% male) reflects the strong participation of women in culinary MSMEs. This finding is consistent with prior MSME literature, which shows that women dominate food-related microbusinesses due to lower entry barriers, flexible operational models, and alignment with socially embedded domestic competencies.

However, unlike traditional narratives that position women entrepreneurs in subsistence-based roles, the present sample of undergraduate students indicates a transition toward opportunity-driven entrepreneurship, which signals a structural shift in the local entrepreneurial ecosystem.

4.1.2 Reliability and Validity Test

Table 2. Reliability and validity test result

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**AVE**
AI (*Z*)	0.746	0.748	0.887	0.797
BS (*Y*)	0.832	0.832	0.899	0.749
EK (X_1)	0.875	0.881	0.923	0.800
VP (X_2)	0.881	0.893	0.926	0.806
X_1-Z-Y	1.000	1.000	1.000	1.000
X_2-Z-Y	1.000	1.000	1.000	1.000

The results in Table 2 show that all constructs demonstrate Cronbach's alpha values above 0.70 and AVE values above 0.50, confirming internal consistency and convergent validity. These measurement properties align with the established SEM standards in entrepreneurship and strategic management research. The strong AVE scores (0.749-0.806) indicate that each latent construct explains more than half of the variance of its indicators, supporting construct validity. This robustness strengthens the confidence that the relationships identified in the structural model are theoretically meaningful rather than artifacts of measurement error. Importantly, the reliability strength is consistent with prior empirical studies examining entrepreneurial knowledge and technology adoption in MSMEs, suggesting that the operationalization of constructs such as EK and AI is stable across contexts.

4.1.3 R-Square Test

Table 3. R-Square test result

	R Square	**R Square Adjusted**
BS (*Y*)	0.821	0.814

The result in Table 3, the R^2 value of 0.821 indicates that 82.1% of the variance in Business Strategy (BS) is explained by Entrepreneurship Knowledge (EK), Vocational Policy (SC Vetrivel et al.), Artificial Intelligence (AI), and their interaction terms. In behavioral and strategic research, an R^2 above 0.75 is generally considered substantial and indicates strong explanatory power. This finding suggests that the integrated framework combining knowledge capability, institutional policy, and technological moderation provides a more comprehensive explanation of MSME strategic behavior than the single-factor models frequently found in earlier studies. Prior research often reported moderate explanatory power when analyzing knowledge or policy variables independently; therefore, this higher R^2 reinforces the argument that MSME competitiveness is multidimensional and technology-contingent.

4.1.4 Outer Loading Test

Table 4. Outer loading test result

	AI (*Z*)	BS (*Y*)	EK (X_1)	VP (X_2)	X_1-*Z*-*Y*	X_2-*Z*-*Y*
X_1* **Z**					1.356	
X_2* **Z**						1.374
X_1.**1**			0.850			
X_1.**2**			0.921			
X_1.**3**			0.911			
X_2.**1**				0.875		
X_2.**2**				0.916		
X_2.**3**				0.903		
Y_1.**1**		0.849				
Y_1.**2**		0.886				
Y_1.**3**		0.861				
Z_1.**1**	0.885					
Z_1.**2**	0.901					

This section describes how the activities are conducted to achieve the goals. The indicators for achieving the objectives and the benchmarks used to state the success of the research activities that have been carried out are explained. Articles can be strengthened by relevant documentation or the main focus of the activity. Documentation can be in the form of images of the implementation or implementation process, product prototypes, tables, graphs, and so on. If there are subheadings in the Results section, write them in capitalized, lowercase letters in bold. As with the other sections, no numbers, letters, or bullets are provided.

According to the results of the outer loading test in Table 4, all indicators load strongly (>0.85) on their respective constructs, confirming indicator reliability. This supports the theoretical clarity of each latent variable, particularly Entrepreneurship Knowledge and Artificial Intelligence, which have often been criticized in prior studies for their conceptual ambiguity. The strong loadings indicate that respondents clearly differentiated between knowledge capability, policy perception, and AI utilization, supporting discriminant validity and strengthening the interpretability of the structural findings.

4.1.5 Total Effect (Moderation and Hypothesis Test)

The Total Effect Test is a statistical method used to assess the overall strength and significance of the relationships between variables in a Structural Equation Model (SEM) or similar analytical framework (Akbar, Mustafa, et al., 2024). The test examines how one variable directly and indirectly influences another, considering both direct effects and the effects that occur through mediators or moderators (Haeruddin et al., 2023; Sekaran & Bougie, 2016).

Table 5. Total Effect test result

	Ori. Sample	Sample Mean	Std. Dev	T Stat	P Values
EK (X_1) -> BS (*Y*)	0.282	0.291	0.080	3.532	**0.000**
VP (X_2) -> BS (*Y*)	-0.043	0.040	0.098	0.442	**0.658**
AI (*Z*) -> BS (*Y*)	0.573	0.569	0.120	4.775	**0.000**
X_1-*Z*-*Y* -> BS (*Y*)	0.251	0.266	0.092	2.724	**0.000**
X_2-*Z*-*Y* -> BS (*Y*)	0.184	0.204	0.097	1.901	**0.000**

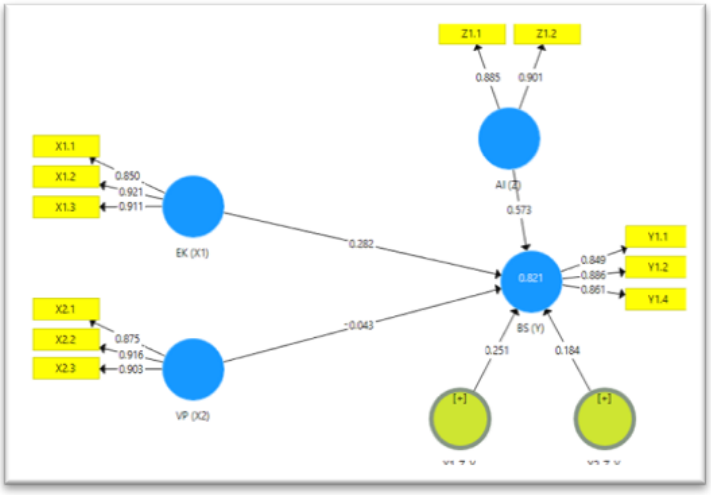

Figure 2. Hypothesis test result

Based on Table 5 and Figure 2, the results of the study that examined the relationship between the influence of Entrepreneurship Knowledge → Business Strategy, Entrepreneurship Knowledge ($\beta = 0.282$; $p < 0.001$) has a significant positive effect on Business Strategy. This finding is consistent with the Resource-Based View (RBV), which posits that knowledge is a strategic intangible asset capable of generating competitive advantage. Previous studies on MSMEs have similarly reported that entrepreneurial knowledge enhances opportunity recognition, innovation capability, and strategic adaptability. Thus, the current findings reinforce the existing literature by empirically confirming that knowledge capability remains a primary strategic driver, even within student-led culinary MSMEs.

In the next test that examined the relationship between Vocational Policy and Business Strategy, Vocational Policy showed a negative and insignificant effect ($\beta = -0.043$; $p = 0.658$). This result diverges from several institutional theory-based studies that report positive policy impacts on MSME performance. This discrepancy may stem from implementation gaps rather than policy design. While prior studies often examine the effectiveness of formal training in structured incubation programs, the respondents in this study may have experienced vocational policies that were more normative than operational. This suggests that policy effectiveness depends heavily on execution quality and technological alignment rather than on mere policy existence.

We then tested the relationship between Artificial Intelligence and Business Strategy, Artificial Intelligence demonstrated a strong positive effect ($\beta = 0.573$; $p < 0.001$), making it the most influential predictor in the model. This finding is consistent with the digital transformation literature, which identifies AI as a strategic enabler that enhances decision-making accuracy, demand forecasting, and customer engagement. However, the magnitude of the effect (57.3%) is higher than that commonly reported in traditional MSME studies. This difference may be attributed to the sample's demographic profile of young, digitally literate undergraduate entrepreneurs who are more capable of integrating AI tools into business operations. Therefore, this study extends prior research by demonstrating that the impact of AI may be contingent on generational digital readiness.

The relationship between the moderating effect of AI Entrepreneurship Knowledge, the interaction between AI and EK is significant ($\beta = 0.251$; $p < 0.001$). This finding supports the Dynamic Capability perspective, which argues that technological tools enhance the strategic value of existing knowledge resources. In contrast to studies that treat knowledge and technology as independent predictors, our findings show that AI amplifies the strategic impact of entrepreneurial knowledge. This indicates complementarity rather than substitution, suggesting that AI does not replace knowledge but enhances its efficiency of application.

Finally, testing the moderating effect of AI on Vocational Policy, although Vocational Policy alone is insignificant, its interaction with AI becomes significant ($\beta = 0.184$; $p < 0.05$). This nuanced finding

partially reconciles the inconsistencies in the previous literature. Prior institutional research has often reported mixed results regarding policy effectiveness. The present study suggests that vocational policy becomes strategically relevant only when coupled with technological capabilities. In other words, AI acts as an enabling mechanism that operationalizes policy benefits into actionable business strategies. This finding contributes theoretically by proposing a contingency-based explanation: policy support alone is insufficient unless it is complemented by digital capability.

4.2 Discussion

The findings confirm that entrepreneurial knowledge functions as a foundational strategic resource in shaping the business strategy of culinary MSMEs. This result is consistent with the Resource-Based View (RBV), which positions knowledge as a valuable intangible asset that enhances competitive advantage through opportunity recognition, innovation capability, and adaptive decision-making. The significant positive effect of entrepreneurship knowledge reinforces prior MSME studies that emphasize human capital as the primary driver of strategic formulation. Moreover, the model's strong explanatory power suggests that integrating knowledge capability with technological and institutional variables provides a more comprehensive understanding of MSME strategic behavior than the single-factor approaches commonly found in earlier research.

Conversely, the insignificant direct effect of vocational policy challenges the dominant institutional theory assumptions that policy intervention automatically strengthens MSME competitiveness. While previous studies frequently report positive policy impacts, the present study's findings indicate that policy effectiveness may depend on implementation quality, operational alignment, and contextual readiness. This discrepancy suggests that vocational policies, when perceived as normative or administrative rather than practical and technology integrated, may fail to translate into tangible strategic outcomes. Therefore, the results refine existing institutional perspectives by proposing that policy presence alone is insufficient to influence business strategy in the absence of complementary enabling mechanisms.

Artificial has emerged as both a strong direct predictor and a significant moderating variable, highlighting its transformative role in MSME strategy. The substantial direct effect of AI on business strategy aligns with the digital transformation literature that identifies AI as a strategic enabler of data-driven decision-making, efficiency enhancement, and market responsiveness. More importantly, the significant interaction effects indicate that AI amplifies the strategic value of entrepreneurial knowledge and operationalizes vocational policy support. This supports the Dynamic Capability perspective, which argues that technological capability enhances the deployment of existing organizational resources. Compared to prior MSME research that often treats technology as a supporting factor, this study positions AI as a structural accelerator of strategic competitiveness, particularly among a digitally literate young entrepreneur demographic.

5. Conclusions

5.1 Conclusion

This study achieved its objective by empirically examining the direct effects of entrepreneurship knowledge and vocational policy on business strategies, as well as the moderating role of Artificial Intelligence (AI) among culinary MSMEs in Makassar. The findings confirm that entrepreneurial knowledge significantly enhances the formulation of adaptive and competitive business strategies. Moreover, AI utilization strengthens the quality of strategic decision-making, improves market responsiveness, and supports product innovation. Although vocational policy demonstrates a supportive influence, its direct impact on business strategy remains limited, indicating that current policy frameworks may not be sufficiently operational, technology-oriented, or aligned with MSME needs.

Beyond its theoretical contribution, this study offers several concrete recommendations. First, policymakers should redesign vocational policies toward implementation-based models by integrating AI literacy, digital analytics training, and applied business simulation into vocational curricula. Local governments should establish AI adoption incentive schemes for MSMEs, such as subsidized access to AI-based marketing tools, digital bookkeeping systems, and customer analytics platforms. Policy

instruments should also move beyond training provision toward structured post-training mentoring, incubation support, and performance-based evaluation mechanisms to ensure measurable and strategic outcomes.

Second, for MSME practitioners, particularly young culinary entrepreneurs, strategic capability development should prioritize AI-driven practices, including data-based market segmentation, predictive demand analysis, automated digital promotion and inventory optimization systems. MSMEs are encouraged to gradually adopt affordable AI applications (e.g., AI-powered social media analytics, chatbots, and financial forecasting tools) to enhance operational efficiency and strategic agility. Third, for institutional collaboration, partnerships between universities, local governments, and MSME associations should be strengthened to create AI-based business clinics and digital-innovation hubs.

Such collaborative ecosystems can accelerate knowledge transfer, reduce technological barriers, and improve MSME competitiveness in Makassar's tourism-driven economy. Overall, this study contributes to the entrepreneurship and strategic management literature by proposing an integrated framework linking knowledge capability, institutional policy, and technological readiness. Practically, it underscores that MSME competitiveness in emerging economies depends not only on entrepreneurial knowledge but also on actionable vocational policies and systematic AI-adoption strategies.

5.2 Research Limitations

This study is limited to 122 culinary MSMEs in Makassar owned and/or operated by undergraduate students, which may constrain generalizability to other sectors, demographic profiles, and regional contexts. Additionally, the cross-sectional research design does not allow for the examination of long-term strategic transformation or progressive AI capability development.

5.3 Suggestions and Directions for Future Research

Future research should incorporate multisectoral MSME samples across different regions to strengthen external validity and comparative analysis. Longitudinal designs are strongly recommended to examine the sustainability of AI-driven strategies and the long-term effectiveness of vocational policy interventions. Further studies should also explore specific AI adoption determinants, such as perceived technological readiness, financial capability, and digital trust, and measure the Return on Investment (ROI) of AI integration in MSME operations. Experimental or quasi-experimental research designs evaluating policy intervention models, such as AI subsidy programs or digital incubation schemes, would provide stronger evidence for designing evidence-based vocational policies that effectively support MSME digital transformation.

Acknowledgement

The authors would like to express their sincere gratitude to all culinary MSME owners in Makassar, who voluntarily participated in this study and provided valuable data through their questionnaire responses. Their contributions were essential for the completion of this study. The authors also acknowledge the support of local stakeholders and vocational education representatives, who provided insights during the data collection process. We appreciate the constructive feedback from our academic colleagues during the development of the research framework and analysis. This research did not receive any specific grants from funding agencies in the public, commercial, or not-for-profit sectors. All research activities were conducted independently by the authors of this study.

Author Contributions

MMI conceptualized the study, developed the research framework, designed the methodology, conducted the formal analysis, and prepared the manuscript's original draft. MYM contributed to the instrument development, data collection, statistical validation, and critical review of the manuscript for important intellectual content. MAFAP supervised the overall research process, refined the theoretical framework, contributed to the interpretation of the findings, and carried out the final review and editing of the manuscript prior to submission. All authors have read and agreed to the published version of the manuscript.

References

Akbar, A., Idris, M., Kurniawan, A. W., Mustafa, M. Y., Natsir, U. D., & Angreyani, A. D. (2024). The Resource-Based View in the Asta Brata and Organisational Performance: A moderating approach of adaptability and innovation. *Journal of Economics and Trade, 9*(2), 50-57. doi:https://doi.org/10.56557/jet/2024/v9i29034

Akbar, A., Mustafa, M. Y., Haeruddin, M., Mariñas-Acosta, C., Hasbiyadi, H., Alam, S., & Darmawinata, W. N. S. (2024). Days of future past: Scrutinising the artificial intelligence impact on the leadership of internationalising SMEs. *Asian Journal of Economics, Business and Accounting, 24*(5), 53-59. doi:https://doi.org/10.9734/ajeba/2024/v24i51292

Akbar, A., Mustafa, M. Y., Razak, N., Angreyani, A. D., Abadi, R. R., & Nurjannah, N. (2023). The rise of skywalker: The critical vehemence of customer loyalty inside the e-commerce platform. *Asian Journal of Education and Social Studies, 41*(2), 57-67. doi:https://doi.org/10.9734/ajess/2023/v41i2893

ASEAN, E. R. I. f., & Asia, E. (2018). *SME Policy Index: ASEAN 2018 boosting competitiveness and inclusive growth: Boosting Competitiveness and Inclusive Growth*: OECD Publishing.

Campilho, R. D. S. G., & Silva, F. J. G. (2023). Industrial process improvement by automation and robotics. *Machines, 11*(11), 1011. doi:https://doi.org/10.3390/machines11111011

Chen, X., & Cheng, X. (2025). Enhanced financial regulation and AI entrepreneurship: Evidence from Chinese cities. *Cities, 165*, 106140. doi:https://doi.org/10.1016/j.cities.2025.106140

Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and Persistence. *Journal of Small Business Management, 53*(1), 75-93. doi:https://doi.org/10.1111/jsbm.12065

Haeruddin, M. I. M., Natsir, U. D., Aslam, A. P., Aswar, N. F., & Mustafa, M. Y. (2023). When Love and hate collide: the influence of conflict on employees' turnover intention. *Asian Journal of Economics, Business and Accounting, 23*(7), 16-27. doi:https://doi.org/10.9734/ajeba/2023/v23i7942.

Kakava, E., Eta, M., & Shepherd, M. (2024). Enhancing entrepreneurial intention in secondary school. *Journal of Sustainable Tourism and Entrepreneurship, 4*, 105-122. doi:https://doi.org/10.35912/joste.v4i3.2034

Kar, S. (2023). Data for better lives: world development report 2021 by World Bank Group. *J Data Sci Informet Citation Stud, 2*(2).

Kaufmann, W., & Lafarre, A. (2021). Does good governance mean better corporate social performance? A comparative study of OECD countries. *International Public Management Journal, 24*(6), 762-791. doi:https://doi.org/10.1080/10967494.2020.1814916

Kumar, M., Raut, R. D., Mangla, S. K., Ferraris, A., & Choubey, V. K. (2024). The adoption of artificial intelligence powered workforce management for effective revenue growth of Micro, Small, and Medium Scale Enterprises (MSMEs). *Production Planning & Control, 35*(13), 1639-1655. doi:https://doi.org/10.1080/09537287.2022.2131620

Kurnia, A., Situmorang, R., & Sudiyono, K. (2025). Penerapan TAM untuk meningkatkan adopsi cloud kitchen oleh UMKM Jabodetabek. *Studi Ilmu Manajemen dan Organisasi, 6*, 363-380. doi:https://doi.org/10.35912/simo.v6i2.4474

Li, Z., & Islam, A. Y. M. A. (2021). Entrepreneurial intention in higher vocational education: an empirically-based model with implications for the entrepreneurial community. *Sage Open, 11*(4), 21582440211059179. doi:https://doi.org/10.1177/21582440211059179

Mack, A., & Honig, B. (2023). Comparing factors influencing entrepreneurial self-efficacy between vocational and academic post-secondary students. *Entrepreneurship Education and Pedagogy, 7*(4), 494-528. doi:https://doi.org/10.1177/25151274231211555

Manan, M. A., Nursari, A., Sejati, H., Yoesseri, D., & Mareta, Y. T. (2024). Readiness of MSMEs in facing the industrial revolution 5.0 through green economy. *Jurnal Akuntansi, Keuangan, dan Manajemen, 5*(4), 439-450. doi:https://doi.org/10.35912/jakman.v5i4.3447

Mumi, A., Ngammoh, N., & Suwanpakdee, A. (2025). The nexus of artificial intelligence and entrepreneurship research: Bibliometric analysis. *Sustainable Futures, 9*, 100688. doi:https://doi.org/10.1016/j.sftr.2025.100688

Mustafa, M. Y., Rauf, D. I., & Killa, B. A. (2023). Consumer behavior: Lifestyle, socialmedia and peer friends on consumptive behavior online shopping for fashion products on the tiktok platform:

Study on management students of Makassar State University. *International Journal of Humanity Advance, Business & Sciences (IJHABS), 1*(1), 33-42. doi:https://doi.org/10.59971/ijhabs.v1i1.19

Mustaffa, M., Tawil, N., Selvaratnam, D., Techanamurthy, U., & Affandi, H. (2024). Empowering digital entrepreneurship in Technical and Vocational Education and Training (TVET) education. *Jurnal Kejuruteraan, 36*, 1459-1466. doi:https://doi.org/10.17576/jkukm-2024-36(4)-11

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: a systematic review and research agenda. *Academy of Management Learning & Education, 16*(2), 277-299. doi:https://doi.org/10.5465/amle.2015.0026

Nguyen, V., Tran, V., Ho, V., Ho, T., & Nguyen, L. (2025). Managing entrepreneurship education for vocational college students: a case study in vietnam's mekong delta region. *Educational Process International Journal, 16*. doi:https://doi.org/10.22521/edupij.2025.16.199

Oktaria, E., Raras, P., Alam, I., Barusman, A., & Habiburrahman, H. (2024). Factors for increasing competitive advantage in MSMEs reviewed from a systematic literature review. *Jurnal Akuntansi, Keuangan, dan Manajemen, 5*, 235-247. doi:https://doi.org/10.35912/jakman.v5i3.3132

Paramita, R., Rizal, N., Bahtiar Sulistyan, R., Taufiq, M., & Dimyati, M. (2021). Optimizing the creative industry through the development of the triple helix model. *IJEBD (International Journal of Entrepreneurship and Business Development), 4*, 655-661. doi:https://doi.org/10.29138/ijebd.v4i5.1514

Rosaely, M., Mukhsin, M., & Nurhayati, E. (2026). Mediasi keunggulan bersaing : pengaruh supply chain management terhadap kinerja perusahaan: studi kasus pada pelaku usaha jasa titip gacoan. *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah, 8*, 2330-2347. doi:https://doi.org/10.47467/alkharaj.v8i3.11558

Rukmana, A. Y., Barliana, M. S., Widiaty, I., Hamdani, A., Abdullah, A. G., Harto, B., . . . Harnani, N. (2024). Systematic Literature Review on Opportunities and Challenges of Vocational Education Business Incubators in Indonesia. *Revista de Gestão Social e Ambiental - RGSA, 18*(5), e05591. doi:https://doi.org/10.24857/rgsa.v18n5-068

Sarah, E., & Uzochukwu, O. (2025). The relationship between creative thinking and product diversification among Micro, Small and Medium Enterprises (MSMEs) in Anambra state. *World Journal of Advanced Research and Reviews, 26*(3), 056-067. doi:https://doi.org/10.30574/wjarr.2025.26.3.2093

Saxena, A. (2025). A Study of the Challenges of the Indian MSME Sector. *International Journal of Education, Modern Management, Applied Science & Social Science, 07*, 102-115. doi:https://doi.org/10.62823/IJEMMASSS/7.2(IV).7880

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*: john wiley & sons.

Singh, S. K., Kumar, S., Goyal, S., Arya, V., Attar, R. W., Gupta, B. B., . . . Chui, K. T. (2025). Leveraging AI and machine learning for enhanced data analytics and visualization in database management with digital twins. *Journal of Database Management, 36*(1). doi:https://doi.org/10.4018/JDM.388135

Sitaridis, I., & Kitsios, F. (2023). Digital entrepreneurship and entrepreneurship education: a review of the literature. *International Journal of Entrepreneurial Behavior & Research, 30*. doi:https://doi.org/10.1108/IJEBR-01-2023-0053

Stadler, A., Alberton, A., & Smith, A. M. J. (2021). Entrepreneurship education in Brazil: Brazilian and Scottish approaches to policy and provision in vocational education. *Journal of Small Business and Enterprise Development, 29*(4), 645-662. doi:https://doi.org/10.1108/JSBED-12-2020-0440

Sulistyaningsih, E., Murti, W., & Ratnasih, C. (2024). Analysis of E-Marketing strategy and business innovation in optimizing improvement of service quality and its effect on MSME income. *ADI Journal on Recent Innovation, 5*(2), 155-167. doi:https://doi.org/10.34306/ajri.v5i2.1045

Surjanti, R., Mulyantomo, E., Triyani, D., & Kurniawati, E. (2025). Improving MSME perfomance through competences and entrepreneurial characteristics. *Annals of Human Resource Management Research, 5*, 171-185. doi:https://doi.org/10.35912/ahrmr.v5i4.3285

Sutrisno, S., Permana, R. M., & Junaidi, A. (2023). Education and training as a means of developing MSME expertise. *Journal of Contemporary Administration and Management (ADMAN), 1*(3), 137-143. doi:https://doi.org/10.61100/adman.v1i3.62

Usman, A., & Hamid, A. (2022). The status and challenges of entrepreneurship education in vocational higher education institutions in Indonesia. *Jurnal Kewirausahaan dan Bisnis, 27*, 130-140. doi:https://doi.org/10.20961/jkb.v27i2.60757

Vetrivel, S., Arun, V., Saravanan, T., & Maheswari, R. (2024). Social emotional learning strategies in higher education *Implementing Interactive Learning Strategies in Higher Education* (pp. 68-94): IGI Global.

Vetrivel, S., Arun, V., Saravanan, T., & Maheswari, R. (2024). Social emotional learning strategies in higher education (pp. 68-94).

Weldeslassie, H. A., Vermaack, C., Gebrekirstos, K., Minwuyelet, L., Tsegay, M., Tekola, N. H., & Gidey, Y. (2019). Contributions of Micro, Small and Medium Enterprises (MSMEs) to income generation, employment and GDP: Case Study Ethiopia. *Journal of Sustainable Development, 12*(3). doi:https://doi.org/10.5539/jsd.v12n3p46

Zhou, R., Rashid, S. M., & Cheng, S. (2024). Entrepreneurship education in Chinese higher institutions: challenges and strategies for vocational colleges. *Cogent Education, 11*(1), 2375080. doi:https://doi.org/10.1080/2331186X.2024.2375080