

Improving Entrepreneurship Education in Micro, Small, and Medium Enterprise Performance Based on Digital Competence and Orientation Through Competitive Advantage Mediation

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Abstract: Digital developments have encouraged culinary SME players to adapt by utilizing technology in order to compete and improve business performance. This study aims to analyze the influence of digital innovation, digital literacy, and entrepreneurial orientation on SME performance, as well as the role of competitive advantage as a mediating variable in the performance of SMEs in Malang City. This study uses a quantitative approach with proportionate purposive sampling and involves 373 respondents. Data processing was carried out using SEM-PLS through SmartPLS 4. The results show that digital innovation, digital literacy, and entrepreneurial orientation have a positive and significant effect on SME performance. Competitive advantage was found to have a positive and significant effect on SME performance and partially mediate the relationship between digital innovation, digital literacy, and entrepreneurial orientation on SME performance. This confirms that SME performance does not only depend on the ability of business actors to innovate and master technology, but also on the ability to transform the use of digital technology into competitive advantage. This study has practical implications for SME actors to develop more strategic digital strategies based on innovation, digital literacy, and entrepreneurship in order to strengthen competitiveness and business performance in a sustainable manner.

Keywords: *Digital innovation, education, entrepreneurship orientation, competitive advantage, SME performance*

A. Introduction

Rapid technological advances are driving major transformations in business practices, from traditional operating systems to digital ones. Digitalization is not only happening in large companies, but also spreading to small businesses, requiring entrepreneurs to adapt to changes in customer behavior, marketing systems, and patterns of interaction in the digital space. This transformation opens up opportunities to expand markets and increase efficiency, but also presents new challenges for businesses with limited competencies and technology. In this context, Micro and Small Enterprises (MSEs) play a crucial role because, despite their limited resources, their contribution to the national economy is significant (Herawati, 2020). According to the Ministry of Cooperatives and SMEs of the Republic of Indonesia (2022), Micro businesses reached 63.95 million units or 99.62% of the total number of national businesses, while small businesses reached 193,959 units or

0.3% of the total number of national businesses, making this sector the main pillar of employment and a pillar of the people's economy.

The contribution of MSMEs to the Indonesian economy is reflected in Gross Domestic Product (GDP) data, which shows that the MSME sector contributes 60.5% of the total national GDP (Ministry of Cooperatives and SMEs of the Republic of Indonesia, 2022b). The dominance of micro and small businesses mainly comes from the wholesale and retail trade, food and beverage provision, and agriculture sectors. Therefore, even though the development of MSMEs is often hampered by limited capital, low digital literacy, a lack of marketing strategies, and the ability to create competitive advantages, MSMEs still have a strategic position in maintaining national economic stability. This condition illustrates a paradox: MSMEs play an important role in driving community economic growth, but at the same time face limitations in their capacity to adapt to changes in the modern business environment.

Locally, Malang City is one of the regions with rapid MSME development, especially in the trade, culinary, and household services sectors, which dominate more than 70% of business activities (Malang City Cooperative, Industry, and Trade Office, 2024). This city also has a high intensity of digital platform use in marketing and transactions, so the demand for digital-based innovation is growing. However, SME actors still face classic obstacles in the form of access to capital, digital readiness, and low competitiveness compared to medium-level businesses. This is reflected in the low national entrepreneurship ratio (3.47%) and the fact that only about 12% of business units utilize digital technology optimally (Antoro, 2024). Thus, improving the performance of Malang City's MSMEs is highly dependent on their ability to innovate and adopt digital technology.

Dynamic capabilities theory is the main foundation of this research because it explains how organizations are able to develop, integrate, and reorganize core competencies and resources to adapt to an ever-changing business environment. According to Teece (2007), the dynamic capabilities framework directs attention to how a business builds and utilizes its potential to keep pace with the rapidly changing market dynamics. This concept is highly relevant to the context of MSMEs in Malang City, where digital innovation, digital literacy, and entrepreneurial orientation serve as dynamic capabilities that enable businesses to respond to opportunities and threats arising from digital transformation. According to Eisenhardt and Martin (2000), dynamic capabilities consist of specific and identifiable processes such as alliance formation, knowledge integration, and strategic decision-making, which can create value in uncertain markets. Within this framework, competitive advantage plays an important role as a mediating variable, ensuring that SMEs' ability to innovate and utilize technology is truly translated into differentiated, value-added strategies that generate superior business performance.

Previous studies have found a significant relationship between digital competence, entrepreneurial orientation, competitive advantage, and SME performance, but the results still vary depending on the context, business characteristics, and the existence of mediating variables (Rachmadi & Prajanti, 2023; Widyanti & Mahfudz, 2020; Yusuf et al., 2023). Some studies show that digital innovation and digital literacy do not always have a

direct effect on performance, but become significant when linked to competitive advantage.

Based on this research gap, this study has novelty in two aspects. The first aspect is the simultaneous integration of digital innovation, digital literacy, and entrepreneurial orientation on SME performance with competitive advantage as a mediator, rather than partially as in previous studies. Finally, it focuses on the context of Malang City SMEs as one of the regions with rapid digital economic development but uneven literacy and business readiness.

Unlike previous studies that assume that digital innovation always results in competitive advantage, this study shows that in the context of culinary MSMEs, digital innovation can improve performance without going through the mechanism of competitive advantage. This finding expands dynamic capabilities theory by emphasizing that the effectiveness of digital capabilities is highly dependent on the level of strategic integration and the ability to reconfigure resources. Thus, this study makes a conceptual contribution by distinguishing between the direct impact of digital innovation on performance and its role in shaping sustainable competitive advantage.

Based on the above description, the purpose of this study is to analyze the effect of digital innovation, digital literacy, and entrepreneurial orientation on the performance of Malang City MSMEs, both directly and indirectly through competitive advantage as a mediating variable, thereby producing a comprehensive understanding of MSME development strategies in the digital era.

B. Methods

The type of research used in this study is a quantitative approach with a survey method, in which data is collected through a series of questions asked to respondents. This approach is in line with Silaen's (2018) opinion, which states that quantitative research is a research procedure that produces numerical data and is analyzed using explanatory research to explain the relationship between variables. In this study, the independent variables (X) consist of digital innovation, digital literacy, and entrepreneurial orientation; the dependent variable (Y) is MSME performance; while the mediating variable (Z) is competitive advantage. The relationship between these variables is arranged in a conceptual framework that describes the flow of influence and mediation mechanisms that will be tested in this study. The following is an image of the conceptual framework of this study.

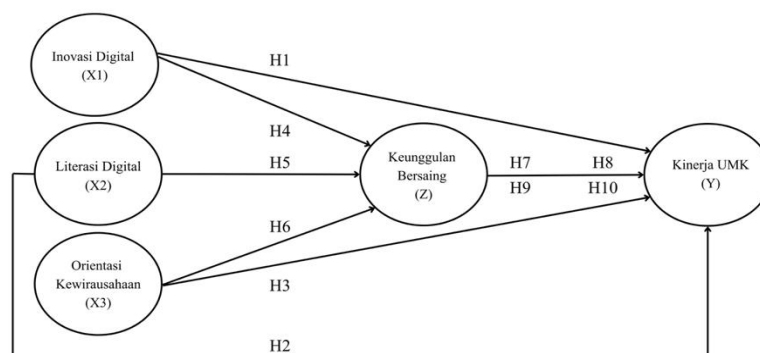


Figure 1. Conceptual Framework
Source: Prepared by the researcher, 2025

The research population consists of 11,929 micro and small enterprises (MSEs) engaged in the culinary sector in Malang City. This study uses proportionate sampling, a method of determining samples that distributes the number of respondents proportionally based on the number of MSEs in each subdistrict (Klojen, Blimbing, Kedungkandang, Lowokwaru, and Sukun). The criteria used in sampling were that respondents were business owners or key managers directly involved in operational activities and important decision-making, MSEs that were still actively operating in the culinary sector, MSEs that had utilized at least one form of digital technology (online marketing, QRIS, marketplaces, or social media), and MSMEs that have been established for at least 2 years, considering that the business has sufficient experience in facing market changes

The types of data used in this study consist of quantitative data obtained through questionnaires distributed to MSME actors in Malang City and qualitative data in the form of supporting descriptions related to digital innovation, digital literacy, entrepreneurial behavior, and competitive advantage practices among culinary MSME actors. The data sources in this study consist of primary and secondary data. Primary data was obtained from questionnaires distributed directly to respondents through offline and online surveys. The questionnaires contained statements related to digital innovation, digital literacy, entrepreneurial orientation, competitive advantage, and business performance. Meanwhile, secondary data was obtained from documents and reports related to the number of MSMEs, the development of the digital economy in Malang City, and previous studies relevant to the research variables.

Field surveys were used as the main method of data collection. The researchers distributed questionnaires in the form of a list of statements to MSME actors in five subdistricts in Malang City to obtain data relevant to the research offline and online using Google Forms. Respondents were asked to fill out the questionnaire according to the instructions provided. This questionnaire was used to obtain the data needed to test the hypothesis.

The data were analyzed using SEM (Structural Equation Modeling) through the PLS (Partial Least Squares) approach with the help of the SmartPLS 4 program. Several stages

of data analysis were carried out, namely using descriptive statistical analysis to determine the distribution of respondents, testing the outer model (convergent validity, discriminant validity, and composite reliability), and the inner model (r-square, f-square, q-square, and bootstrapping).

C. Results and Discussion

Results

The results of the outer model evaluation show that all indicators in the variables of digital innovation (X1), digital literacy (X2), entrepreneurial orientation (X3), competitive advantage (Z), and MSME performance (Y) have a loading factor value above 0.70, as shown in Table 1. These values indicate that all indicators are valid and adequately reflect the latent constructs. Thus, no indicators were eliminated. The previous statement mentioning loading values above 0.90 has been adjusted to be consistent with the table data showing a value range of 0.75–0.90.

Tabel 1. Hasil Loading Factor

	Inovasi Digital (X1)	Keunggulan Bersaing (Z)	Kinerja UMK (Y)	Literasi Digital (X2)	Orientasi Kewirausahaan (X3)
X1.1	0,808				
X1.2	0,851				
X1.3	0,870				
X2.1				0,814	
X2.2				0,752	
X2.3				0,859	
X3.1					0,810
X3.2					0,824
X3.3					0,815
Y1.1			0,893		
Y1.2			0,897		
Y1.3			0,908		
Y1.4			0,895		
Z1.1		0,846			
Z1.2		0,852			
Z1.3		0,894			

Furthermore, the Average Variance Extracted (AVE) results in Table 2 show that all constructs have AVE values above the minimum threshold of 0.50, indicating that convergent validity is met. The differences in AVE figures that previously appeared in the narrative have been corrected by referring to a consistent set of AVE values according to the table. Thus, each construct is able to adequately explain the variance of its indicators, in line with the criteria of Fornell and Larcker.

Tabel 2. Hasil Average Variance Extracted (AVE)

	Average Variance Extracted (AVE)
Inovasi Digital (X1)	0,893
Literasi Digital (X2)	0,830
Orientasi Kewirausahaan (X3)	0,853
Kinerja UMK (Y)	0,779

Keunggulan Bersaing (Z)	0,799
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Discriminant validity testing through cross loading shows that each indicator has the highest loading value on the construct it measures compared to other constructs. This confirms that each variable digital innovation, digital literacy, entrepreneurial orientation, competitive advantage, and MSME performance has clear conceptual differences and does not overlap. In addition, the composite reliability value of all variables is above 0.70, which indicates a very good level of internal reliability.

Tabel 3. Hasil Cross Loading

	Inovasi Digital	Literasi Digital	Orientasi Kewirausahaan	Kinerja UMK	Keunggulan Bersaing
ID1	0,947	0,845	0,728	0,649	0,735
ID2	0,940	0,843	0,726	0,631	0,723
ID3	0,948	0,850	0,788	0,652	0,743
LD1	0,873	0,933	0,745	0,610	0,734
LD2	0,863	0,937	0,806	0,615	0,777
LD3	0,698	0,861	0,659	0,446	0,684
OK1	0,752	0,781	0,918	0,593	0,773
OK2	0,687	0,721	0,925	0,581	0,758
OK3	0,751	0,748	0,928	0,602	0,769
KU1	0,623	0,549	0,601	0,866	0,614
KU2	0,651	0,624	0,633	0,909	0,661
KU3	0,539	0,470	0,480	0,884	0,491
KU4	0,655	0,698	0,701	0,592	0,888
KB1	0,646	0,665	0,722	0,597	0,886
KB2	0,752	0,765	0,772	0,563	0,873
KB3	0,611	0,545	0,560	0,915	0,579

Tabel 4. The Result of Composite Reliability

Variabel	Composite Reliability
Inovasi Digital	0,962
Literasi Digital	0,936
Orientasi Kewirausahaan	0,946
Kinerja UMK	0,941
Keunggulan Bersaing	0,914

In the inner model evaluation, the R-square value shows that UMK performance can be explained by 52.0%, while competitive advantage is explained by 74.2% by the independent variables in the model. The narrative of the results has been adjusted to be consistent with the values listed in the table, so that there are no longer any differences in interpretation. The positive Q-square values for both endogenous variables also indicate that the model has good predictive power. Meanwhile, the f-square results indicate that entrepreneurial orientation contributes most strongly to the formation of competitive advantage compared to other variables.

Tabel 5. Hasil Bootstrapping

Hipotesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (O/STDEV)	P-Values
Literasi Digital (X1) – Kinerja UMK (Y)	0,516	0,514	0,089	5,802	0,000
Literasi Digital (X2) – Kinerja UMK (Y)	-0,219	-0,219	0,106	2,073	0,038

Orientasi Kewirausahaan (X3) – Kinerja UMK (Y)	0,155	0,156	0,077	2,028	0,043
Inovasi Digital (X1) – Keunggulan Bersaing (Z)	0,124	0,125	0,061	2,026	0,043
Literasi Digital (X2) – Keunggulan Bersaing (Z)	0,292	0,292	0,061	4,743	0,000
Orientasi Kewirausahaan (X3) – Keunggulan Bersaing (Z)	0,495	0,495	0,043	11,546	0,000
Keunggulan Bersaing (Z) – Kinerja UMK (Y)	0,308	0,311	0,083	3,729	0,000
Inovasi Digital (X1) – Keunggulan Bersaing (Z) – Kinerja UMK (Y)	0,038	0,039	0,023	1,676	0,094
Literasi Digital (X2) – Keunggulan Bersaing (Z) – Kinerja UMK (Y)	0,090	0,090	0,031	2,913	0,004
Orientasi Kewirausahaan (X3) – Keunggulan Bersaing (Z) – Kinerja UMK	0,498	0,504	0,061	8,184	0,000

Based on the bootstrapping results presented in Table 5, it can be concluded that most of the relationships between variables in the research model are significant and the hypotheses are accepted, both in terms of direct and indirect effects. Digital literacy, entrepreneurial orientation, and digital innovation are proven to have an effect on MSME performance and competitive advantage, and competitive advantage itself has a significant effect on MSME performance. However, there is one hypothesis that is rejected, namely the indirect effect of digital innovation on SME performance through competitive advantage. The rejection of this hypothesis indicates that competitive advantage has not been able to become an effective intermediary in channeling the influence of digital innovation on SME performance. Although digital innovation has a direct effect, the mediation path through competitive advantage has not made a significant contribution. Meanwhile, the mediating relationship between digital literacy and entrepreneurial orientation shows significant results, indicating the role of competitive advantage as a partial mediator in improving the performance of culinary SMEs in Malang City.

Discussion

Digital Innovation and MSME Performance

The results indicate that digital innovation has a positive and significant effect on the performance of culinary MSMEs in Malang City, suggesting that higher levels of digital innovation are associated with improved sales, business stability, and overall performance. This finding reflects the adaptive characteristics of MSME actors, most of whom are first-generation entrepreneurs of productive age with more than five years of business experience, making digital innovation increasingly important during the business development phase. From a dynamic capabilities perspective, digital innovation enables MSMEs to sense market changes, adjust pricing and products, and improve operational responsiveness. These findings are consistent with prior studies showing that digital innovation enhances productivity, efficiency, and business resilience (Yusuf et al., 2023; Xue et al., 2023; Hidayat et al., 2022; Martini et al., 2023). Unlike studies

emphasizing sophisticated digital systems, this research highlights that simple technologies such as WhatsApp Business, social media, and delivery platforms remain effective when aligned with MSME characteristics and market needs.

Digital Literacy and MSME Performance

Digital literacy is found to have a positive and significant effect on MSME performance, although its impact is weaker than that of digital innovation. This indicates that the ability to understand, manage, and utilize digital information contributes meaningfully to operational efficiency, marketing effectiveness, and customer interaction. Most respondents developed digital literacy through practical experience rather than formal education, using platforms such as cashier applications and WhatsApp Business for daily operations. Within the dynamic capabilities framework, digital literacy supports adaptive capabilities by enabling MSMEs to recognize consumer trends and adjust business processes accordingly. These results align with previous studies confirming the role of digital literacy in improving sales, customer satisfaction, and operational efficiency (Wahyundaru et al., 2024; Febrianawati et al., 2024; Innana et al., 2023; Rakib et al., 2023; Putri & Iffan, 2024). However, digital literacy in this context remains largely operational rather than strategic.

Entrepreneurial Orientation and MSME Performance

Entrepreneurial orientation has a positive and significant effect on the performance of culinary MSMEs in Malang City, indicating that proactiveness, innovativeness, and risk-taking behavior play a strategic role in improving business outcomes. From a dynamic capabilities perspective, MSMEs demonstrate relatively strong sensing and seizing capabilities, although reconfiguring resources remains limited. The dominance of first-generation entrepreneurs with extensive business experience strengthens proactive decision-making and opportunity recognition. These findings are consistent with previous studies emphasizing that entrepreneurial orientation enhances performance, particularly when supported by flexibility and technological readiness (Arabache et al., 2022; Kiyabo & Isaga, 2019; Xue et al., 2023). Nevertheless, the effectiveness of entrepreneurial orientation is influenced by managerial capacity and local structural constraints.

Digital Innovation and Competitive Advantage

Digital innovation has a positive and significant impact on the competitive advantage of culinary MSMEs in Malang City, particularly in improving service quality, adaptability, and product differentiation. Within the dynamic capabilities framework, digital innovation functions mainly as a sensing capability that allows MSMEs to identify market trends and consumer preferences. However, its contribution to sustainable competitive advantage remains limited, as most MSMEs rely on basic technologies such as WhatsApp Business, QRIS, and social media due to capital constraints. These findings are consistent with prior studies highlighting the role of digital innovation in enhancing productivity and flexibility (Widyanti & Mahfudz, 2020; Xue et al., 2023; Wahdi, 2021), while also emphasizing the gradual and context-dependent nature of digital transformation in micro-scale enterprises.

Digital Literacy and Competitive Advantage

The findings show that digital literacy positively and significantly influences the competitive advantage of culinary MSMEs in Malang City. Digital literacy enables MSMEs to manage multiple platforms, understand customer behavior, and build a professional digital presence, thereby strengthening differentiation and competitiveness. From a dynamic capabilities perspective, digital literacy serves as an adaptive capability that supports continuous improvement in marketing strategies and service quality. These results are consistent with previous studies demonstrating that digital literacy enhances market expansion, business identity, and performance (Firmansyah et al., 2024; Rakib et al., 2023; Angkhasakulkiat et al., 2025). However, digital literacy remains largely experience-based rather than strategically structured

Entrepreneurial Orientation and Competitive Advantage

Entrepreneurial orientation has a positive and significant effect on competitive advantage, confirming that proactive, innovative, and risk-taking behavior enables MSMEs to sustain relevance in competitive markets. Consistent with dynamic capabilities theory, entrepreneurial orientation supports opportunity recognition and strategic responsiveness. The dominance of experienced first-generation entrepreneurs further strengthens adaptability to local competition. These findings align with prior research emphasizing entrepreneurial orientation as a key driver of competitive advantage (Kiyabo & Isaga, 2019; Widyanti & Mahfudz, 2020; Annisa et al., 2023), while highlighting the importance of local market experience in shaping competitiveness.

Competitive Advantage and MSME Performance

Competitive advantage has a positive and significant impact on MSME performance, indicating that differentiation, customer relationships, and value creation are critical for sustaining growth and stability. MSMEs with longer business experience and medium turnover levels are better positioned to translate competitive strategies into improved performance. From a dynamic capabilities perspective, competitive advantage reflects the ability to reorganize resources and adapt strategies in response to market dynamics. These findings support prior studies linking competitive advantage to improved MSME performance (Putri et al., 2020; Susanti et al., 2023), while emphasizing that in Malang City, competitive advantage is built more through experience and customer proximity than advanced technology.

Competitive Advantage as a Mediator

The mediation analysis reveals that competitive advantage does not mediate the effect of digital innovation on MSME performance, indicating that digital innovation primarily delivers direct operational benefits rather than sustainable differentiation. In contrast, competitive advantage partially mediates the relationship between entrepreneurial orientation and performance, suggesting that entrepreneurial behavior yields stronger performance outcomes when translated into concrete competitive strategies. These findings confirm that in the context of culinary MSMEs in Malang City, digital literacy and entrepreneurial orientation contribute more effectively to performance when transformed into competitive advantage, consistent with prior studies (Rakib et al., 2023; Widiyanti et al., 2024).

D. Conclusions

Based on the research results, it can be concluded that digital innovation, digital literacy, and entrepreneurial orientation play an important role in improving the performance of culinary MSMEs in Malang City, both directly and indirectly through competitive advantages. The findings show that MSME players already have a relatively good level of digital innovation, digital literacy, entrepreneurial orientation, and competitive advantage, as reflected in the average values of each variable. Digital innovation, digital literacy, and entrepreneurial orientation have been proven to have a positive and significant effect on MSME performance and contribute to shaping competitive advantage. Competitive advantage itself has been proven to be a key factor in driving business performance improvement, particularly in terms of increased sales and market expansion. Furthermore, the mediation test results show that competitive advantage partially mediates the influence of digital literacy and entrepreneurial orientation on MSME performance, indicating that the impact of these two variables will be more optimal if they can be translated into a real differentiator in the market. However, competitive advantage does not mediate digital innovation on MSME performance, as shown by previous results. Thus, this study confirms that improving MSME performance does not only depend on digital capabilities and entrepreneurial attitudes, but also on the ability of business actors to convert these resources and competencies into sustainable competitive advantages.

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