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THE INFLUENCE OF ENTREPRENEURIAL CHARACTERISTICS, PRODUCT INNOVATION, AND DIGITAL LITERACY ON MSME PERFORMANCE

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Akbar Bagaskara[1], Diesyana Ajeng Pramesti[1,2]

[1]Management Study Program / Faculty of Economics and Business, Muhammadiyah University Magelang, Indonesia
[2]Master in Management and Entrepreneurship Study Program/ Faculty of Economics and Business, Muhammadiyah University Magelang, Indonesia

*Corresponding author:
Email: diesyana.ajeng@unimma.ac.id

Abstract

This study aims to analyze the influence of Entrepreneurial Characteristics, Product Innovation, and Digital Literacy on the performance of MSMEs in Magelang City and Regency. This study used a quantitative approach with a purposive sampling technique, involving 102 respondents, namely MSMEs that had been operating for at least two years. Data were collected through a questionnaire using a 5-point Likert scale and then analyzed using multiple linear regression with SPSS 25 software. The results showed that Product Innovation and Digital Literacy had a positive and significant influence on MSME performance, while Entrepreneurial Characteristics had no significant influence on MSME performance. These findings emphasize the importance of strengthening product innovation and digital literacy to improve MSME performance in an era of increasingly fierce business competition.

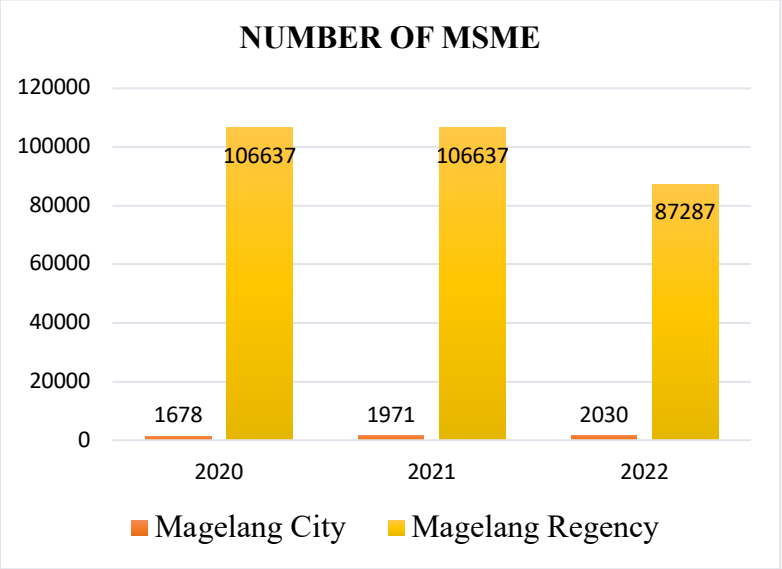
Keywords: Entrepreneurial Characteristics, Product Innovation, Digital Literacy, MSME Performance

Introduction

Micro, Small, and Medium Enterprises (MSMEs) are a strategic sector that plays a crucial role in the Indonesian economy, particularly in driving economic growth and employment. MSMEs in Magelang City and Regency continue to show significant growth, despite facing challenges such as the pandemic and increasingly fierce market competition. MSME performance is a key factor in determining business sustainability and development amidst the dynamics of modern business. In the Industry 4.0 era, MSMEs are required to adapt quickly by strengthening entrepreneurial characteristics, product innovation, and mastering digital literacy. These three factors are believed to increase MSME competitiveness and operational effectiveness, thereby supporting improved business performance (Pramesti et al., 2025). However, the actual impact of these factors on MSME performance in the Magelang region still requires empirical analysis to

provide more appropriate strategic recommendations. MSME performance is a crucial factor in determining business success because it plays a key role in achieving desired goals.

Performance optimization is necessary through the improvement and development of every business activity to demonstrate company excellence (Komariah et al., 2022). The development of MSMEs can be observed through the growth in the number of business units, which reflects the ability of business actors to survive, thrive, and contribute to the welfare of the community and the local economy. In Magelang City and Regency, changes in the number of MSMEs in recent years have become an indicator of business performance. Good performance supports business sustainability and growth, while poor performance can lead to a decline in the number of MSMEs.



Source: (DataGo, 2024) and (Pusaka, 2022)

Fig 1.1 Number of MSMEs in Magelang City and Regency

Figure 1 shows that the number of MSMEs in Magelang City has continued to increase over the past three years, reflecting economic growth and the success of business actors in adapting, innovating, and utilizing digital literacy. Conversely, MSMEs in Magelang Regency remained stable in 2020–2021, then declined in 2022 due to the pandemic, before rebounding to 109,000 business actors in 2023 (Suyitno, 2023). This demonstrates the importance of strong performance in maintaining business continuity. These findings emphasize the importance of adaptation strategies, innovation, and digital literacy in maintaining the sustainability and performance of MSMEs. There is a difference of opinion in the research by (Suwadji & Rahmatika, 2022)) which found that entrepreneurial characteristics have a positive influence on MSME performance.

(Farida & Cipta, 2024) stated that product innovation has a positive and significant impact on MSME performance. Meanwhile, research conducted by (Tania & Pratama, 2025) found that product innovation negatively impacts MSME performance. (Farhan et al., 2022) found that digital literacy significantly improves the performance of MSMEs in the food and beverage sector. This finding suggests that mastery and application of digital technology can improve MSME business performance in this sector. Meanwhile, research by (Fitriasari et al., 2021) concluded that digital literacy has no impact on improving MSME performance. Based on the above, this study is entitled "The Influence of Entrepreneurial Characteristics, Product Innovation, and Digital Literacy on MSME Performance: An Empirical Study of MSMEs in Magelang City and Regency."

Based on the research and phenomena explained above, the researcher is interested in conducting a study entitled "The Influence of Entrepreneurial Characteristics, Product Innovation, and Digital Literacy on MSME Performance (Empirical Study of MSMEs in Magelang City and Regency)".

Literature Review

Goal Setting Theory

Goal Setting Theory, proposed by (Locke, 1968), explains that setting specific and challenging goals can improve performance because it provides direction, motivation, and aids in strategic planning. The theory emphasizes five key principles: clarity, challenge, commitment, feedback, and task complexity. When individuals are committed to well defined goals and receive continuous feedback, they are more likely to adjust strategies and sustain motivation, ultimately achieving higher performance levels (Park & Choi, 2020). In an organizational context, goal setting serves not only as a motivational mechanism but also as a cognitive framework that guides planning and decision making processes.

In the context of MSMEs, Goal Setting Theory is highly relevant to explain how entrepreneurial characteristics, product innovation, and digital literacy influence business performance. Entrepreneurs with strong self-confidence, leadership, and results orientation are more capable of formulating clear business targets and committing to their achievement. Product innovation reflects goal directed strategic action, where MSMEs set competitive objectives such as developing new products or expanding market segments to improve sales and profitability. Meanwhile, digital literacy strengthens the feedback and evaluation process, enabling MSMEs to monitor performance metrics, refine marketing strategies, and respond adaptively to market changes. Therefore, this theory provides a comprehensive foundation for understanding how individual capabilities and strategic initiatives translate into measurable improvements in MSME performance.

MSME Performance

According to (Febriati et al., 2023), MSME performance refers to the income of small and medium-sized entrepreneurs, measured from the time the business is founded until it reaches its target. To accurately assess the condition of MSMEs, simple parameters are often used to determine their performance level. According to (Malikhah et al., 2024), performance can be measured using five indicators:

1. Sales Growth
2. Capital Growth
3. Employee Growth
4. Marketing Growth
5. Profit Growth.

Entrepreneurial Characteristics

According to (Tunjung Sari et al., 2022), entrepreneurial characteristics are attitudes or actions taken by a person in utilizing resources such as labor, raw materials, and capital effectively, relying on creativity and innovation to create new business opportunities. The success of a business also depends on entrepreneurial traits, which are key to increasing efficiency, enabling MSMEs to view things more positively, and encouraging creativity (Mukoffi & As'adi, 2021). According to (Rusdiana, 2018), five indicators are used to measure entrepreneurial characteristics:

1. Self-confidence
2. Task and results-oriented
3. Leadership
4. Courage to take risks
5. Originality.

Product Innovation

Product innovation in MSMEs is an effort to update or develop products to add value and competitive advantage. This innovation includes the creation of new products, quality improvements, attractive designs, and functional packaging. In a conventional context, innovation can be defined as a breakthrough. The higher the level of product innovation undertaken by MSMEs, the greater the likelihood of achieving better performance goals (Komariah et al., 2022). According to (Uffandi, 2023), product innovation is measured using three indicators that can influence MSME performance:

1. Truly New Products (new products in the world),
2. New Products (imitation products),
3. Product Line Expansion.

Digital Literacy

According to Paul Gilster, digital literacy is defined as the ability to understand and use information from various formats, emphasizing critical thinking processes when dealing with digital media rather than technical competencies as a core skill in digital literacy, and emphasizing critical evaluation of what is found through digital media rather than the technical skills required to access that media (Gunawan Wibowo, 2021).

Digital literacy is believed to have a strategic role in driving improved performance of MSMEs in the digital era. According to (Kartika & Ratnamiasih, 2023), four indicators for measuring digital literacy are as follows:

1. Internet Search,
2. Hypertext Navigation,
3. Content Evaluation,
4. Knowledge Assembly

Goal Setting Theory, which posits that specific and challenging goals enhance performance by directing effort, increasing persistence, and encouraging strategic behaviour (Jeong et al., 2023). It proposes that entrepreneurial characteristics, product innovation, and digital literacy are critical drivers of MSME performance. Entrepreneurs with strong traits such as self-confidence, risk-taking propensity, and future orientation are more likely to formulate clear business objectives and remain committed to achieving them, thereby improving firm performance (Nguyen et al., 2021). Product innovation represents a goal directed strategic response that enhances differentiation, competitive advantage, and long term growth (Fakhreddin & Foroudi, 2025). Meanwhile, digital literacy strengthens the ability of MSMEs to set measurable targets, utilize feedback from digital platforms, and improve operational efficiency and market reach in dynamic environments (Naayif et al., 2025). Therefore hypotheses are constructed as follows:

H1: Entrepreneurial characteristics have a positive effect on MSME performance
H2: Product innovation has a positive effect on MSME performance
H3: Digital literacy has a positive effect on MSME performance

Resarch Method

Data and sample

The population of this study was MSMEs in Magelang City and Magelang Regency. The sampling method used was purposive sampling. The criteria used in this study were MSMEs that had been established for at least two years. This criterion was chosen because MSMEs that survive for two years have generally passed the initial risk period and demonstrated business sustainability and stability worthy of analysis.

Based on the above criteria, the sample size for this study was 102 respondents. This study used a quantitative approach. Data collection was conducted through in-person surveys

and distributed online questionnaires. The medium used was a Google Form distributed to MSMEs in Magelang City and Regency. The analytical tool used was multiple linear regression analysis.

n = (6 x number of indicators)

= (6 x 17)

= 102

The sample size, based on the formula above, is 102 respondents.

Data Analysis

Validity Test

This The results of the Kaiser Meyer Olkin Measure of Sampling (KMO MSA) validity test met the validity test criteria and were deemed valid based on the CFA analysis. The KMO value was greater than 0.50 and the Bartlett's test (Sig) was less than 0.05, indicating that the data could be processed for further testing. The next test, Measure of Sampling Adequacy (MSA), analyzes each variable to determine which variables can be processed further. The MSA must have an MSA value > 0.50, as shown in the Loading Factor table, as shown in Table 1.

Table 1 Validity Test Results

Variable	*KMO MSA*	Sig	*Loading Factor*	Conclusion
MSME Performance (Y)	0,754	0,000	0,746	Valid
			0,602	
			0,749	
			0,811	
			0,779	
Entrepreneurial Characteristics (X1)	0,861	0,000	0,826	Valid
			0,850	
			0,889	
			0,848	
			0,906	
Product Innovation (X2)	0,733	0,000	0,692	Valid
			0,765	

			0,751	
Digital Literacy (X3)	0,657	0.000	0,684	Valid
			0,626	
			0,678	
			0,636	

Reliability Test

Reliability measurements are conducted to determine the extent to which research results remain consistent and reliable. By measuring reliability, researchers can increase confidence in the data obtained and determine the validity of research findings. Data is considered reliable if it has a Cronbach's Alpha value > 0.7. The following table shows the Cronbach's Alpha values for each instrument:

Table 2 Reliability Test Results

Variable	Statements	Cronbach's Alpha	Result
Entrepreneurial Characteristics *(X1)*	5 Statements	0,898	Reliabel
Product Innovation (X2)	3 Statements	0,875	Reliabel
Digital Literacy *(X3)*	4 Statements	0,748	Reliabel
MSME Performance (Y)	5 Statements	0,791	Reliabel

Multiple Linear Regression Analysis

Multiple linear regression analysis was used to determine the level of influence of the independent variables, namely Entrepreneurial Characteristics (X1), Product Innovation (X2), and Digital Literacy (X3), on the dependent variable, namely MSME Performance (Y). A summary of the regression analysis results can be seen in Table 4.5 below.

Table 3 Multiple Linear Regression Analysis

Variable	*Unstandarized Coefficients*		T	Sig.
	β	Std. Error		
(Constant)	−0,369	0,523	−0,705	0,482
Entrepreneurial Characteristics	0,114	0,075	1,521	0,132
Product Innovation	0,786	0,116	6,771	0,000

Digital Literacy	0,541	0,032	16,943	0,000

Based on the values in Table 3 above, the multiple linear regression equation is as follows:

$$Y = -0{,}369 - 0{,}114X1 + 0{,}786X2 + 0{,}541X3 + e$$

From the multiple linear regression equation above, the regression line equation provides the following information:

1. A constant value of −0.369 indicates that if the variables of entrepreneurial characteristics, product innovation, and digital literacy are considered constant or have no effect (zero), then the resulting MSME performance value is −0.369.
2. The regression coefficient $\beta 1$ is 0.114. The significance value (Sig.) is 0.132 > 0.05, indicating that the influence of entrepreneurial characteristics on MSME performance is not statistically significant in this study.
3. The regression coefficient $\beta 2$ is 0.786. A significance value of 0.000 < 0.05 indicates that this influence is statistically significant. Therefore, it can be concluded that product innovation has a positive and significant influence on MSME performance.
4. The regression coefficient $\beta 3$ is 0.541. With a significance value of 0.000 < 0.05, the influence of digital literacy on MSME performance is also statistically significant.

Coefficient of Determination (R^2)

Table 4 Coefficient of Determination (R^2)

R	R Square	Adjusted R Square	Std.Eror of the estimate
0,975	0,950	0,948	0,744

Source: Primary data was processed using SPSS 25, (2025)

Based on Table 4.6, the Adjusted R Square value is 0.950 or 95%. It can be concluded that the regression model developed in this study is very robust in explaining MSME performance variables. This means that the variables of entrepreneurial characteristics, product innovation, and digital literacy make a significant contribution to MSME performance.

F Test (Goodness Of Fit)

Table 5 F Test

Model	*Sum of Squares*	df	*Mean Square*	F	Sig.
Regresion	1024,565	3	341,522	617,622	.000[b]
Residual	54,190	98	0,533		
Total	1078,755	101			

Source: Primary data was processed using SPSS 25, (2025)

Based on the table, the F test results show that the probability value of the equation or significance level is less than 0.05, namely 0.000 < 0.05, and the calculated F value is 617.622. The F-table value is obtained from the formula df = n − k − 1. Based on the number of respondents (n = 102) and the number of independent variables (k = 3), df1 = k = 3 and df2 = n − k − 1 = 102 − 3 − 1 = 98. With a significance level of 0.05 (α = 5%), the F-table value for df1 = 3 and df2 =

98 is 2.7. These results indicate that the calculated F value of 617.622 is greater than the F–table value of 2.7.

T test

Table 6 T Test

Variabel	*Unstandarized Coefficients* B	t–count	Sig.
Karakteristik Wirausaha	0,144	1,521	0,132
Inovasi Produk	0,786	6,771	0,000
Literasi Digital	0,541	16,943	0,000

Source: Primary data was processed using SPSS 25, (2025)

The t–test is used to determine whether each independent variable has a significant impact on the dependent variable. This test is conducted with a t–test significance value of 0.05 (α = 5%). Based on n = 102, df = n – 1, the t–table yields a significance value of 1.983.

Result and Discussion

a. The Influence of Entrepreneurial Characteristics on MSME Performance

Based on Table 6, entrepreneurial characteristics have a calculated t–value of 1.521, which is smaller than the t–table value of 1.983. The significance value is 0.132, which is greater than 0.05. Therefore, H0 is accepted and H1 is rejected. This means that entrepreneurial characteristics do not affect the performance of MSMEs in Magelang City and Regency.

These results are inconsistent with goal setting theory (Locke, 1968), which emphasizes the importance of specific and challenging goals and a strong commitment to improving performance. In this study, entrepreneurial characteristics have not been able to encourage MSMEs to set clear and measurable business goals. This phenomenon is evident in the relatively low entrepreneurial characteristics indicators, namely low task and results orientation and a lack of support for strategic planning. Consequently, their contribution to performance is suboptimal, and the impact is not yet visible in the short term.

The results of this study are inconsistent with those of (Suwadji & Rahmatika, 2022) and (Yeni et al., 2024), which demonstrated a positive influence of entrepreneurial characteristics on MSME performance. Based on the results of the hypothesis testing conducted, which are consistent with the theory used, entrepreneurial characteristics do not emerge instantly but rather require considerable time. These characteristics play a larger role in shaping the foundation and direction of a business, so their impact is only optimally felt after MSMEs have been operating for five years or more. Their contribution is not maximized in the first two to five years. This indicates that entrepreneurial characteristics do not affect MSME performance. The results of this study align with research conducted by (Ayu Susanti & Nida Laili, 2023), which showed that entrepreneurial characteristics do not affect MSME performance.

b. The Influence of Product Innovation on MSME Performance

Based on the results of data processing in Table 6, the product innovation has a calculated t value of 6.771, which is greater than the t table value of 1.983, and a significance value of 0.000, which is smaller than 0.05. Thus, H0 is rejected and H2 is accepted, which means that product innovation has a positive and significant influence on the performance of MSMEs in Magelang City and Regency. This indicates that the ability of MSMEs to create new products or carry out product development can improve MSME performance.

The results of this study align with goal-setting theory (Locke, 1968), which emphasizes the importance of specific and challenging goals and a strong commitment to improving performance. MSMEs that set clear and challenging product development targets will be encouraged to innovate to achieve their business goals. This innovation process reflects the entrepreneur's commitment to sustainable growth amidst market competition. The higher the level of product innovation undertaken by MSMEs, the higher their performance, both in terms of increased sales, customer satisfaction, and business competitiveness.

The results of this study align with those conducted by (Fitriana & Ali, 2024) and (Lorensa & Hidayah, 2022), which stated that product innovation has a positive influence on MSME performance. Based on the results of the hypothesis test, in line with the theory used, the ability to create or develop products can provide added value and attract consumers. Expand the following sentence by referring to improving MSME performance. This indicates that product innovation has a positive and significant influence on MSME performance.

c. The Influence of Digital Literacy on MSME Performance

Based on the results of data processing in Table 6, the digital literacy variable has a t-value of 16.943, which is greater than the t-value of 1.983 in the table, and a significance value of 0.000, which is less than 0.05. Therefore, H0 is rejected and H3 is accepted, indicating that digital literacy has a positive and significant influence on the performance of MSMEs in Magelang City and Regency. This finding indicates that the ability of MSMEs to utilize digital technology, such as social media, e-commerce platforms, and business support applications, plays an important role in increasing business effectiveness and productivity.

The results of this study align with goal-setting theory (Locke, 1968), which emphasizes that well-defined, challenging, and committed goals will improve individual and organizational performance. MSMEs with digital literacy are able to develop clear and measurable business goals throug the use of technology, enabling them to design marketing strategies, manage sales data, and expand market reach more effectively. The higher the level of digital literacy of MSMEs, the higher their performance, both in terms of operational efficiency, customer satisfaction, and business competitiveness.

The results of this study align with research conducted by (Tiffani, 2023), which stated that digital literacy has a positive and significant impact on MSME performance. Based on the results of the hypothesis test, the theory used suggests that the ability to utilize digital technology in business activities can be influenced by the commitment of MSME actors to achieve business goals more effectively. The use of digital technologies, such as social media and e-commerce platforms, helps MSMEs improve operational efficiency, expand market reach, and increase revenue. Therefore, the development and implementation of digital technology are key to supporting the growth and sustainability of MSMEs in today's digital era. This demonstrates that digital literacy has a positive impact on MSME performance.

Conclusion

This study examines the influence of entrepreneurial characteristics, product innovation, and digital literacy on the performance of MSMEs in Magelang City and Regency using a quantitative approach with 102 MSMEs. Based on Goal Setting Theory, the findings indicate that product innovation and digital literacy have a positive and significant influence on MSME performance, while entrepreneurial characteristics do not show a significant direct effect. These results

suggest that in digital and competitive business environment, concrete strategic actions such as continuous product development and effective utilization of digital technology can increase sales growth, market expansion, and operational efficiency. This study contributes to the literature by providing empirical evidence from a regional MSME context and by clarifying that performance is not solely influenced by entrepreneurial characteristics but also requires support from innovation capabilities and digital competencies.

However, this study has several limitations. The sample size is relatively limited and restricted to MSMEs operating for at least two years in a single geographic region, which may limit generalizability. Furthermore, the use of cross sectoral data and self-reported measures may not fully capture long term performance dynamics. Future research is recommended to use larger and more diverse samples, longitudinal designs, and additional variables such as entrepreneurial orientation, dynamic capabilities, or environmental turbulence to better understand the mechanisms linking individual characteristics and strategic capabilities to MSME performance. Exploring mediating or moderating effects could also provide deeper insights into how innovation and digital literacy strengthen business sustainability.

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