

The Moderating Role of Human Resource Competence in The Relationship Between Digital Literacy, Marketing Innovation, and MSMEs Business Performance in Pontianak

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Abstract

This study aims to analyze the effect of digital literacy and marketing innovation on MSME business performance in Pontianak, with human resource competence as a moderating variable. The study employed a quantitative approach using a survey method involving 200 food and beverage MSMEs in Pontianak selected through purposive sampling. Data were analyzed using Moderated Regression Analysis (MRA) with SPSS 23. The findings reveal that digital literacy has a positive and significant effect on MSME business performance ($B = 0.098$; $p < 0.05$), while marketing innovation demonstrates the strongest influence on business performance ($B = 0.421$; $p < 0.001$). Furthermore, human resource competence significantly moderates the relationship between digital literacy, marketing innovation, and MSME business performance. The coefficient of determination ($R^2 = 0.611$) indicates that 61.1% of MSME business performance can be explained by the variables examined in this study. These findings imply that strengthening digital capability, marketing innovation, and human resource competence is essential for improving MSME competitiveness and sustainability in the digital era.

Keywords:

Digital Literacy; Marketing Innovation; Human Resource Competence; Business Performance; MSMEs.

1. INTRODUCTION

The rapid advancement of information and communication technology has significantly transformed business activities, particularly in marketing practices. Digital transformation encourages businesses, including Micro, Small, and Medium Enterprises (MSMEs), to adopt digital technologies in order to improve efficiency, expand market reach, and enhance customer engagement (APJII, 2024). In Indonesia, the number of internet users has reached approximately 221.5 million with a penetration rate of 79.5%, indicating that digital technology has become an integral part of economic activities (APJII, 2024). This rapid digital growth also creates broader opportunities for MSMEs to integrate digital strategies into their business processes, particularly in marketing and customer interaction (Nuche et al., 2024).

In this context, digital literacy plays a crucial role, as it reflects an individual's ability to access, understand, evaluate, and utilize digital technologies effectively (Bawden, 2008; Gilster, 1997). Digital skills are considered essential competencies in the 21st century because they support information management, communication, problem-solving, and business adaptability in digital environments (van Laar et al., 2017). Digital literacy also encompasses the ability to manage, integrate, and communicate information through digital platforms in a safe and appropriate manner (Law et al., 2018). For MSMEs, digital literacy enables business actors to optimize digital platforms for promotion, communication, and operational management. Furthermore, digital literacy is not only limited to technical skills but also involves cognitive, social, and cultural competencies that support effective digital engagement (Belshaw, 2014). Empirical evidence shows that higher levels of digital literacy significantly contribute to improving business productivity and marketing effectiveness (Sakti et al., 2025a). Digital literacy also plays an important role in improving MSME

productivity and business sustainability through the effective utilization of digital marketing strategies (Sakti et al., 2025b).

Complementing digital literacy, marketing innovation is also essential, as it allows businesses to develop creative strategies and adapt to dynamic consumer behavior. According to (Kotler & Keller, 2016), marketing innovation involves the development of new marketing methods to enhance product value and strengthen customer relationships. In addition, the integration of digital marketing strategies and entrepreneurial competence has been shown to significantly improve marketing performance through competitive advantage (Al-atsari et al., 2025). MSMEs that actively engage in marketing innovation and utilize digital platforms tend to achieve better performance outcomes, particularly in the digital economy era (Fauziah & Suarantalla, 2025). Marketing innovation significantly contributes to SME market performance by enhancing customer engagement, competitive advantage, and business adaptability in dynamic markets (Aksoy, 2017).

However, the effectiveness of digital literacy and marketing innovation is not solely determined by technology adoption. Human resource (HR) competence plays a critical role in ensuring that these strategies are implemented effectively. Human Resource Competence, which includes knowledge, skills, abilities, and attitudes, is a key determinant of organizational effectiveness and business performance (Spencer & Spencer, 1993). Human resource competence is also an important factor in supporting MSME sustainability because competent business actors are more capable of adapting to technological and market changes (Rahmat & Handayani, 2023). In the context of digital transformation, competent human resources are essential for supporting the adoption and optimization of digital technologies (Ladewi et al., 2025), and are recognized as strategic drivers of sustainable digital transformation (Espina-Romero et al., 2025).

In Pontianak, although many MSMEs have begun adopting digital tools, limitations in digital literacy, marketing innovation, and Human Resource Competence still hinder optimal business performance. In Pontianak, the food and beverage MSME sector represents one of the most active business sectors in utilizing social media and digital platforms for marketing activities. However, many MSMEs still experience challenges in maximizing digital technology, implementing innovative marketing strategies, and improving human resource competence. Therefore, examining the interaction among these variables is important to better understand how MSMEs can improve business competitiveness and sustainability in the digital era.

Therefore, examining the interaction among these variables is highly relevant. Previous studies also indicate that digital literacy, organizational culture, and engagement act as important drivers in enhancing SME performance in competitive environments (Lusiah et al., 2025). The growing body of literature highlights the increasing importance of digital transformation in enhancing the competitiveness of MSMEs. Previous studies indicate that higher levels of digital literacy significantly contribute to improved business performance, especially in terms of marketing effectiveness, operational efficiency, and customer engagement (Rahayu & Day, 2017; Setiawan, 2019). Furthermore, entrepreneurial competence, market orientation, and digital literacy have been shown to positively influence marketing performance (Ramdan et al., 2025). MSMEs with strong digital literacy are better equipped to adopt e-commerce platforms, social media marketing, and digital payment systems, which ultimately enhance their competitiveness in the digital economy.

In addition to digital literacy, marketing innovation has been identified as a key driver of business performance. Empirical studies have shown that businesses that actively engage in marketing innovation tend to experience higher growth and sustainability (Hult et al., 2004; O'Dwyer et al., 2009). This is further supported by the argument that marketing innovation is essential for SMEs to remain competitive in rapidly evolving digital environments (Setiawan, 2019). Furthermore, human resource (HR) competence has been consistently emphasized as a critical factor influencing organizational performance. Human Resource Competence encompasses knowledge, skills, abilities, and attitudes that enable individuals to perform their tasks effectively (Spencer & Spencer, 1993). Several studies suggest that competent human resources not only directly improve business performance but also enhance the effectiveness of other strategic factors, including digital adoption and innovation (Wibowo, 2016). This indicates that Human Resource Competence plays both a direct and indirect role in driving MSME success.

Recent studies have begun to explore the interaction between digital literacy, marketing innovation, and Human Resource Competence. Some researchers argue that Human Resource Competence can act as a moderating variable that strengthens the relationship between digital capabilities and business performance (Sari & Nugroho, 2021). This perspective suggests that even if MSMEs adopt digital technologies and innovative marketing strategies, their effectiveness largely depends on the competence of the human resources managing these processes. Despite the extensive literature, there remains a gap in studies that integrate digital literacy, marketing innovation, and Human Resource Competence within a single comprehensive model, particularly in the context of MSMEs in Pontianak. Therefore, this study aims to provide a more holistic understanding by examining the influence of digital literacy and marketing innovation on MSME business performance, with Human Resource Competence acting as a moderating variable.

In Pontianak, the food and beverage MSME sector is one of the fastest-growing business sectors and contributes significantly to the local economy. The increasing use of digital platforms such as Instagram,

TikTok, Facebook, and online marketplaces has encouraged MSMEs to adopt digital marketing strategies to maintain competitiveness. However, many MSME actors still face challenges related to digital literacy, marketing innovation, and human resource competence, which may hinder business performance optimization. Therefore, examining these variables in the context of Pontianak’s MSMEs becomes important to understand how digital capability and Human Resource Competence influence business sustainability and competitiveness in the digital era.

2. RESEARCH METHOD

2.1. Research Design

This study employs a quantitative research approach with an explanatory design to analyze the relationships between variables. The quantitative method is used to systematically measure and test the influence of digital literacy and marketing innovation on MSME business performance, with human resource (HR) competence as a moderating variable. Quantitative research is appropriate for examining causal relationships and testing hypotheses using statistical analysis (Sugiyono, 2019).

2.2. Population and Sample

The population of this study consists of Micro, Small, and Medium Enterprises (MSMEs) in the food and beverage sector in Pontianak City that actively utilize social media as a marketing tool. This sector was selected because it represents one of the most intensive users of digital marketing in the region.

The sampling technique employed in this study is purposive sampling, a method in which respondents are selected based on specific criteria relevant to the research objectives (Sugiyono, 2019). The criteria for sample selection are as follows:

- a. MSMEs operate within the administrative area of Pontianak City.
- b. MSMEs in the food and beverage sector that have been operating for at least six months.
- c. MSMEs that utilize social media platforms for marketing purposes, such as Instagram, Facebook, and TikTok.
- d. MSMEs that have at least one employee or owner responsible for managing digital marketing activities.

The sample size was determined using the Slovin formula with a margin of error of 10% (0.10), as expressed below:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

N = sample size

N = population size (39,697 MSMEs)

e = margin of error (0.10)

The calculation is presented as follows:

$$n = \frac{39.697}{1 + 39.697(0,1)^2} = \frac{39.697}{397,97} = 99,75$$

Based on this calculation, the minimum required sample size is 100 respondents. However, to enhance the robustness and reliability of the analysis, the number of respondents was increased to 200. A larger sample size is expected to improve the accuracy of the findings and provide better representation of the population.

2.3. Data Collection Technique

Data were collected through a structured questionnaire distributed to respondents. The questionnaire uses a Likert scale to measure perceptions related to digital literacy, marketing innovation, Human Resource Competence, and MSME business performance. The Likert scale is widely used in quantitative research to capture attitudes and perceptions in a measurable form (Siregar, 2017).

2.4. Measurement Scale

The measurement of variables in this study uses a Likert scale to assess respondents' perceptions of digital literacy, marketing innovation, human resource (HR) competence, and MSME business performance. The Likert scale is widely used in quantitative research to measure attitudes, opinions, and perceptions in a structured and quantifiable manner (Siregar, 2017). In this study, a five-point Likert scale is applied, with response categories ranging from strongly agree to strongly disagree. The measurement scale is presented in Table 1.

Table 1. Measurement Scale (Likert Scale)

No	Response Category	Code	Score
1	Strongly Agree	SS	5
2	Agree	S	4
3	Less Agree	KS	3
4	Disagree	TS	2
5	Strongly Disagree	STS	1

2.5. Research Variables and Measurement

This study consists of three types of variables:

Independent Variables (X): Digital literacy (X1) and marketing innovation (X2)

Dependent Variable (Y): MSME business performance

Moderating Variable (Z): Human resource (HR) competence

Each variable is operationalized into several indicators derived from relevant theories and previous studies. Business performance is measured using indicators such as effectiveness, efficiency, and growth (Richard et al., 2009), while Human Resource Competence includes knowledge, skills, and abilities (Spencer & Spencer, 1993).

The research instrument used in this study was a structured questionnaire distributed to MSME actors in Pontianak. Digital literacy was measured using 10 statement items focusing on the ability to access, evaluate, and utilize digital information. Marketing innovation was measured using 8 items related to promotional strategies, product innovation, and customer engagement. Human resource (HR) competence was measured using 8 items concerning knowledge, managerial capability, and technical skills. Meanwhile, MSME business performance was measured using 10 items covering sales growth, operational effectiveness, profitability, and customer satisfaction.

The indicators for each variable were adapted from relevant previous studies. Example statements in the questionnaire included: "I am able to utilize digital platforms effectively for business promotion," "My business frequently implements innovative marketing strategies," and "I have sufficient competence to manage digital business operations".

2.6. Conceptual Framework

The conceptual framework of this study illustrates the relationship between variables, where digital literacy and marketing innovation are hypothesized to have a direct effect on MSME business performance. In addition, Human Resource Competence is proposed as a moderating variable that strengthens the relationship between digital literacy and business performance, as well as between marketing innovation and business performance.

Thus, the framework explains that higher levels of digital literacy and marketing innovation are expected to improve business performance, and this effect will be stronger when supported by high Human Resource Competence. This relationship reflects the importance of integrating technological capability, innovation, and human resource quality in enhancing MSME competitiveness in the digital era.

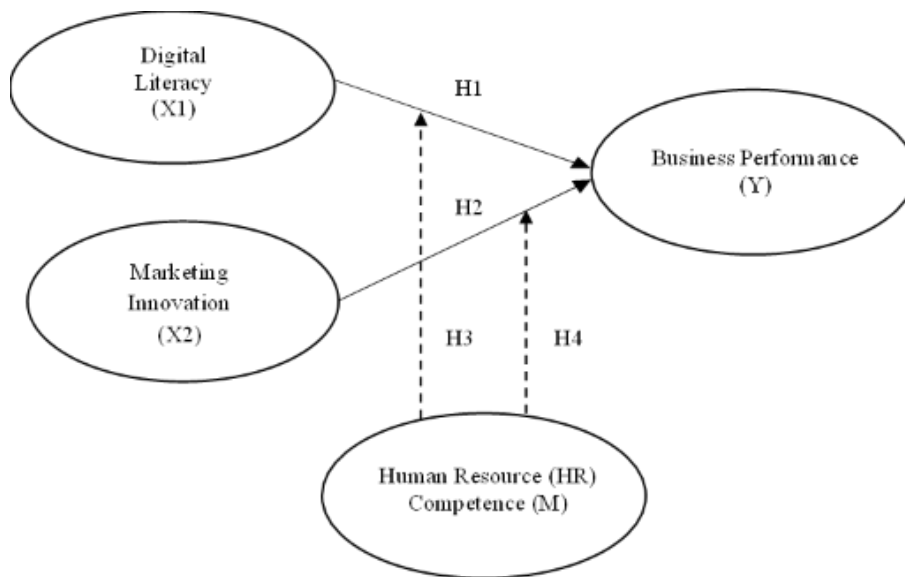


Figure 1. Research Framework

- H1: Digital literacy has a positive effect on business performance.
- H2: Marketing innovation has a positive effect on business performance.
- H3: Human resource (HR) competence moderates the effect of digital literacy on business performance.
- H4: Human resource (HR) competence moderates the effect of marketing innovation on business performance.

2.7. Data Analysis Technique

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). The analysis procedures include the following steps:

- a. Descriptive Analysis. Descriptive statistics are used to describe the characteristics of respondents and the distribution of research variables.
- b. Instrument Testing. Validity Test: Conducted using the corrected item-total correlation to ensure that each indicator is valid.
- c. Reliability Test: Measured using Cronbach’s Alpha to assess the consistency of the instrument (Ghozali, 2016).
- d. Classical Assumption Tests. Normality Test: Conducted using statistical and graphical approaches. Multicollinearity Test: Evaluated using tolerance and Variance Inflation Factor (VIF) values.
- e. Multiple Linear Regression Analysis Used to analyze the effect of digital literacy and marketing innovation on MSME business performance (Purnomo, 2016).
- f. Hypothesis Testing. t-test: To examine the partial effect of each independent variable. F-test: To examine the simultaneous effect of all independent variables.
- g. Coefficient of Determination (R²): To measure the explanatory power of the model.
- h. Moderated Regression Analysis (MRA)MRA is used to test the moderating role of Human Resource Competence by including interaction terms between independent variables and the moderating variable (Ghozali, 2016).
- i. Correlation Analysis and Strength of Relationship. Correlation analysis is used to measure the strength and direction of the relationship between variables. The correlation coefficient (r) ranges from 0 to 1, where values closer to 1 indicate a stronger relationship, while values closer to 0 indicate a weaker relationship (Ghozali, 2016). The interpretation of the correlation coefficient is presented in Table 2.

Table 2. Correlation Level and Strength of Relationship

No	Correlation Coefficient (r)	Strength of Relationship
1	0,00 – 0,199	Very Weak
2	0,20 – 0,399	Weak
3	0,40 – 0,599	Moderate
4	0,60 – 0,799	Strong
5	0,80 – 1,000	Very Strong

Source: (Ghozali, 2016)

3. RESULTS AND DISCUSSION

Based on the results of the respondent characteristics analysis, the majority of respondents were female (56.5%), compared to male respondents (43.5%), indicating the significant role of women in MSME activities in Pontianak. In terms of age, most respondents were in the 21–30 age group (35.5%), followed by those aged 31–40 (29%), suggesting that the sector is largely driven by individuals in their productive years who remain active and adaptable to business developments. Regarding educational background, most respondents had completed senior high school (38.5%), followed by those holding a bachelor's degree (33.5%). This reflects that MSME actors generally possess an adequate educational foundation to manage their businesses, although there is still a need to enhance their capacity, particularly in mastering modern and digital-related skills.

Meanwhile, in terms of business experience, the largest proportion of respondents had been operating their businesses for more than six years (33.5%), followed by those with 1–3 years of experience (31.5%), indicating a mix of well-established and relatively new entrepreneurs. In terms of workforce size, most MSMEs employed 1–5 workers (48.5%), showing that the majority of businesses are still small-scale with relatively simple organizational structures. Overall, these characteristics suggest that MSMEs in Pontianak are predominantly managed by individuals of productive age with sufficient business experience; however, they largely operate on a small scale and therefore require capacity building, particularly in strengthening business strategies and digital marketing, in order to remain competitive.

Table 3. Respondent Categories for MSME in Pontianak

No.	Variable	Category	Frequency (n)	Percentage
1.	Gender	Male	87	43.5
		Female	113	56.5
2.	Age (Years)	≤ 20 years	9	4.5
		21 – 30 years	71	35.5
		31 – 40 years old	58	29
		41 – 50 years old	42	21
		> 50 years	20	10
3.	Highest level of education	Senior High School	77	38.5
		Diploma Degree	33	16.5
		Bachelor Degree	67	33.5
		Master Degree	23	11.5
4.	Length of Business Operation	< 1 years	18	9
		1 – 3 years	63	31.5
		4 – 6 years	52	26
		> 6 years	67	33.5
5.	Number of Employees	1 – 5 employees	97	48.5
		6 – 10 employees	61	30.5
		11 – 20 employees	28	14
		> 20 employees	14	7

Source: Processed data (2025)

The validity test was conducted by calculating the correlation between each question item and the total score. The calculated correlation value (r -calculated) was compared with the r -table value at a significance level (α) 5% (0,05), where $df = (n-2) = 200 - 2 = 198$, thus, the r -table value can be seen in the product moment r table at $df = 198$, which is 0,138. Decision criteria:

- a. If r -calculated $>$ r -table, then the statement is considered valid.
- b. If r -calculated \leq r -table, then the statement is considered not valid.

Table 4. Validity Test of Digital Literacy Variable (X1)

No.	Item	r-calculated	r-table	Decision
1	X1.1	0,412	0,138	Valid
2	X1.2	0,385	0,138	Valid
3	X1.3	0,428	0,138	Valid
4	X1.4	0,401	0,138	Valid
5	X1.5	0,398	0,138	Valid
6	X1.6	0,415	0,138	Valid
7	X1.7	0,372	0,138	Valid
8	X1.8	0,389	0,138	Valid
9	X1.9	0,423	0,138	Valid
10	X1.10	0,430	0,138	Valid

Source: Processed data (2025)

Table 5. Validity Test of the Marketing Innovation Variable (X2)

No.	Item	r-calculated	r-table	Decision
1	X2.1	0,402	0,138	Valid
2	X2.2	0,387	0,138	Valid
3	X2.3	0,419	0,138	Valid
4	X2.4	0,396	0,138	Valid
5	X2.5	0,408	0,138	Valid
6	X2.6	0,395	0,138	Valid
7	X2.7	0,421	0,138	Valid
8	X2.8	0,402	0,138	Valid
9	X2.9	0,414	0,138	Valid
10	X2.10	0,429	0,138	Valid

Source: Processed data (2025)

Table 6. Validity Test of the Human Resource Competence Variable (M)

No.	Item	r-calculated	r-table	Decision
1	M.1	0,391	0,138	Valid
2	M.2	0,378	0,138	Valid
3	M.3	0,403	0,138	Valid
4	M.4	0,395	0,138	Valid
5	M.5	0,412	0,138	Valid
6	M.6	0,408	0,138	Valid
7	M.7	0,400	0,138	Valid
8	M.8	0,417	0,138	Valid
9	M.9	0,392	0,138	Valid
10	M.10	0,401	0,138	Valid

Source: Processed data (2025)

Table 7. Validity Test of the Business Performance Variable (Y)

No.	Item	r-calculated	r-table	Decision
1	Y.1	0,405	0,138	Valid
2	Y.2	0,398	0,138	Valid
3	Y.3	0,412	0,138	Valid
4	Y.4	0,421	0,138	Valid
5	Y.5	0,387	0,138	Valid
6	Y.6	0,399	0,138	Valid
7	Y.7	0,414	0,138	Valid
8	Y.8	0,403	0,138	Valid
9	Y.9	0,426	0,138	Valid
10	Y.10	0,430	0,138	Valid

Source: Processed data (2025)

Table 8 shows that the Cronbach's Alpha values for all variables are greater than 0.60, indicating that the measurement items are valid as measurement instruments. Therefore, the questionnaire used to measure digital literacy, marketing innovation, human resource competence, and business performance is considered reliable as a measurement tool (Table 8).

Table 8. Reliability Test Results

No.	Variable	Cronbach's Alpha	Reliability Standard	Decision
1	Digital Literacy (X1)	0,875	0,60	Valid
2	Marketing Innovation (X2)	0,882	0,60	Valid
3	Human Resource Competence (M)	0,869	0,60	Valid
4	Business Performance (Y)	0,890	0,60	Valid

Source: Processed data (2025)

Based on the results of the normality test using the Kolmogorov-Smirnov method in Table 9, the Asymp. Sig. (2-tailed) value is 0.200, which is greater than 0.05. This value indicates that the residual data in this study are normally distributed. Therefore, the normality assumption in the regression model has been fulfilled, allowing the analysis to proceed to the next stage. This condition also indicates that the data are appropriate for examining the effect of digital literacy and marketing innovation on the business performance of MSMEs in Pontianak, with human resource competence as a moderating variable. The normality test can be seen in Table 9.

Table 9. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		200
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	5.12944559
Most Extreme Differences	Absolute	.077
	Positive	.040
	Negative	-.058
Test Statistic		.077
Asymp. Sig. (2-tailed)		.200 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Source: Processed data (2025)

Based on Table 10, the significance values of deviation from linearity for the relationship between X1 and Y, X2 and Y, and M and Y are 0.214, 0.187, and 0.231, respectively, all of which are greater than 0.05. These values indicate that the relationships between each independent variable and the dependent variable are linear. This means that changes in digital literacy, marketing innovation, and human resource competence are followed by consistent changes in the business performance of MSMEs. Therefore, the linearity assumption in this research model has been satisfied, allowing the regression analysis to proceed. The linearity test can be seen in Table 10.

Table 10. Linearity Test Results

No	Variable Relationship	Sig. Linierity	Sig. Deviation from Linearity	Decision
1	X1 → Y	0,000	0,214	Linier
2	X2 → Y	0,000	0,187	Linier
3	M → Y	0,000	0,231	Linier

Source: Processed data (2025)

Based on Table 11 the tolerance values for digital literacy, marketing innovation, and human resource competence are 0.521, 0.487, and 0.563, respectively, all of which are above 0.10. The VIF values are also relatively low, namely 1.918, 2.053, and 1.776, which are below the threshold of 10. These results indicate that there is no high correlation among the independent variables in the model. Therefore, it can be concluded that the regression model is free from multicollinearity and is suitable for further analysis. The multicollinearity test can be seen in Table 11.

Table 11. Multicollinearity Test Results

No.	Variable	Tolerance	VIF
1	Digital Literacy (X1)	0,521	1,918
2	Marketing Innovation (X2)	0,487	2,053
3	Human Resource Competence (M)	0,563	1,776

Source: Processed data (2025)

The results of the moderation test can be seen in Table 12.

Table 12. Moderation Test Results (MRA) Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	4.982	2.105			2.368	.019
Digital Literacy	.098	.045	.0162		2.178	.031
Marketing Innovation	.421	.051	.558		8.255	.000
Human Resources Competence	.275	.067	.312		4.104	.000
X1*M	.065	.028	.141		2.321	.021
X2*M	.112	.034	.229		3.294	.001

a. Dependent Variable: Business Performance

Source: Processed Data, 2025

Moderation Equation:

$$Y = 4.982 + 0.098X1 + 0.421X2 + 0.275M + 0.065(X1 \times M) + 0.112(X2 \times M)$$

Where:

- Y = Business Performance
- X1 = Digital Literacy
- X2 = Marketing Innovation
- M = Human Resources Competence

Equation Analysis:

- a. Constant (4.982) indicates that when all independent variables (Digital Literacy, Marketing Innovation, and Human Resource Competence) as well as the moderation interaction terms are equal to zero, MSME business performance remains at a baseline value of 4.982. Although this condition is rarely observed in practice, the constant reflects the initial level of business performance before being influenced by the research variables.
- b. Digital Literacy Coefficient / X₁ (0.098) implies that a one-unit increase in digital literacy will increase MSME business performance by 0.098 units, assuming other variables remain constant. This suggests that the ability of MSME actors to utilize digital technology contributes positively to improving business performance. Marketing Innovation Coefficient / X₂ (0.421) indicates that a one-unit increase in marketing innovation will increase business performance by 0.421 units, ceteris paribus. This confirms that creative and innovative marketing strategies have a substantial impact on MSME success.
- c. Human Resource Competence Coefficient / M (0.275) shows that a one-unit increase in human resource competence will increase business performance by 0.275 units. This implies that better abilities, skills, and knowledge of MSME actors lead to higher business performance.
- d. Interaction Coefficient between Digital Literacy and Human Resource Competence / X₁*M (0.065) indicates that human resource competence strengthens the effect of digital literacy on business performance. Each increase in the interaction term leads to a 0.065-unit increase in business performance. This means that the impact of digital literacy becomes stronger when supported by higher Human Resource Competence.
- e. Interaction Coefficient between Marketing Innovation and Human Resource Competence / X₂*M (0.112) shows that human resource competence also strengthens the effect of marketing innovation on business performance. Each increase in this interaction term increases business performance by 0.112 units. In other words, marketing innovation becomes more effective when supported by adequate Human Resource Competence.

Human resource competence positively affects organizational performance through improved employee capability, knowledge, and managerial effectiveness (Saputra et al., 2022). This indicates that MSMEs with competent human resources are more capable of optimizing digital literacy and marketing innovation

strategies effectively. In practice, MSME actors who possess strong managerial and technical competencies tend to adapt more easily to digital transformation and market changes, thereby improving business performance more significantly.

Based on Table 13, the R (correlation) value obtained from the data processing is 0.782. This correlation coefficient indicates a strong relationship between digital literacy, marketing innovation, and human resource competence and the business performance of MSMEs in Pontianak. The results of the multiple linear regression analysis can be seen in Table 13.

Table 13. Results of Correlation Analysis (R) and Coefficient of Determination (R²) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782 ^a	.611	.605	2.145

a. Predictors: (Constant), Digital Literacy, Marketing Innovation, Human Resources Competence

Source: Processed Data, 2025

The coefficient of determination (R²) value of 0.611 indicates that 61.1% of the variation in business performance can be explained by the three independent variables, namely digital literacy, marketing innovation, and human resource competence. The remaining 38.9% is influenced by other factors outside the research model, such as market conditions, business capital, business location, and other external factors not examined in this study. Therefore, the model used in this study demonstrates a relatively strong ability to explain the business performance of MSMEs.

The calculated F-value is 15.982, which is greater than the F-table value of 3.04, and the significance value is 0.000, which is less than 0.05. Therefore, the null hypothesis (H₀) is rejected and the alternative hypothesis (H_a) is accepted. This indicates that digital literacy (X₁), marketing innovation (X₂), human resource competence (M), and the interaction terms simultaneously have a significant effect on MSME business performance (Y). The results of the simultaneous effect test using Moderated Regression Analysis (MRA) can be seen in Table 14.

Table 14. Simultaneous Test Results (F Test) ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1854.327	5	370.865	60.214	.000 ^b
	Residual	1194.553	194	6.157		
	Total	3048.880	199			

a. Dependent Variable: Business Performance

b. Predictors: (Constant), Digital Literacy, Marketing Innovation, Human Resource Competence, Digital Literacy*Human Resource Competence, Marketing Innovation*Human Resource Competence

Source: Processed Data, 2025

The calculated t-value for the Digital Literacy variable is 2.333, which is greater than the t-table value of 1.972, and the significance value is 0.021, which is less than 0.05. Therefore, the null hypothesis (H₀) is rejected and the alternative hypothesis (H_a) is accepted, indicating that Digital Literacy has a significant partial effect on MSME business performance in Pontianak.

The calculated t-value for the Marketing Innovation variable is 9.365, which is greater than the t-table value of 1.972, and the significance value is 0.000, which is less than 0.05. Therefore, the null hypothesis (H₀) is rejected and the alternative hypothesis (H_a) is accepted, indicating that Marketing Innovation has a significant partial effect on MSME business performance in Pontianak. The results of the partial effect test can be seen in Table 15.

Table 15. Results of the Partial Effect Test (t-test) Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.742	2.318		2.476	.014
	Literasi Digital	.112	.048	.185	2.333	.021
	Inovasi Pemasaran	.487	.052	.645	9.365	.000

a. Dependent Variable: Business Performance

Source: Processed Data, 2025

Marketing innovation has the strongest influence on MSME business performance because the food and beverage sector highly depends on promotional creativity and customer engagement. The use of digital platforms such as Instagram, TikTok, Facebook, and online marketplaces enables MSMEs to reach broader consumers, improve brand visibility, and strengthen customer relationships more effectively. Innovative marketing strategies also help MSMEs adapt to changing consumer preferences and increasing market competition in the digital era.

This study has several limitations. First, the use of purposive sampling limits the generalization of the findings to all MSMEs in Indonesia. Second, this study only focuses on food and beverage MSMEs in Pontianak, so the findings may not fully represent other business sectors or regions. Third, this study uses cross-sectional data collected at one point in time, which may not fully capture changes in MSME business performance over time. Therefore, future studies are expected to involve broader sectors, apply probability sampling techniques, and utilize longitudinal approaches to obtain more comprehensive findings. In addition, future studies may explore other moderating variables that potentially influence MSME business performance in the digital era.

4. CONCLUSION

Based on the findings of the study on the Moderating Role of Human Resource Competence in the relationship between digital literacy, marketing innovation, and MSME business performance in Pontianak, the following conclusions can be drawn:

- a. Digital literacy has a positive and significant effect on MSME business performance. This indicates that the higher the ability of MSME actors to utilize digital technology, the better the resulting business performance.
- b. Marketing innovation has a positive and significant effect on MSME business performance. This means that the more creative and innovative the marketing strategies implemented, the better the business performance achieved. Marketing innovation also becomes the most dominant factor influencing MSME business performance.
- c. Human resource competence has a positive and significant effect on MSME business performance. This confirms that the abilities, skills, and knowledge of business actors are crucial factors in improving business performance.
- d. Human resource competence moderates the effect of digital literacy on MSME business performance. In other words, Human Resource Competence strengthens the relationship between digital literacy and business performance.
- e. Human resource competence also moderates the effect of marketing innovation on MSME business performance. This implies that higher Human Resource Competence enhances the impact of marketing innovation on improving business performance.
- f. MSME actors are encouraged to improve digital literacy and continuously develop innovative marketing strategies through digital platforms and social media to enhance business competitiveness and sustainability. Local governments and related institutions are also expected to provide training and assistance programs focusing on digital capability and human resource development for MSME.
- g. Future studies are expected to involve broader MSME sectors, apply probability sampling techniques, and utilize longitudinal data to obtain more comprehensive findings regarding MSME business performance in the digital era. Future research may also explore other moderating variables that potentially influence MSME business performance.

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