

The Role of Financial Literacy in Mediating the Effect of Kaizen Concept Implementation on Production Cost Control among Food and Beverage MSMEs in Pangkajenne City

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Abstract

This study aims to examine the effect of Kaizen concept implementation on production cost control among micro, small, and medium-sized enterprises (MSMEs) in the food and beverage sector in Pangkajenne City, and to investigate the mediating role of financial literacy. One of the persistent issues faced by MSMEs is weak cost control due to inadequate cost recording and management practices. The Kaizen approach, which emphasizes continuous and incremental improvement, is expected to enhance cost efficiency. However, its effectiveness is believed to be maximized when supported by sufficient financial literacy. A descriptive quantitative method was employed, and data were analyzed using Partial Least Squares (PLS). Data were collected through questionnaires distributed to 97 food and beverage MSME owners operating container-based outlets in Pangkajenne. The results reveal that: (1) Kaizen implementation has a positive and significant effect on production cost control; (2) financial literacy also has a positive and significant effect on production cost control; and (3) financial literacy significantly mediates the relationship between Kaizen implementation and production cost control. These findings suggest that achieving optimal cost efficiency requires not only consistent application of Kaizen practices but also strengthening financial literacy among MSME actors.

Keywords: Kaizen, financial literacy, production cost control, MSMEs.

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are a crucial pillar in driving national economic growth (Al Farisi, S., 2022). Globally, MSMEs contribute to nearly 60% of employment and account for about half of the gross domestic product (GDP) (Larios, F. et al., 2023). Therefore, MSMEs play a vital role in increasing per capita GDP and generating more job opportunities compared to large corporations, particularly in developing countries such as Indonesia (Tarihoran, A.D.B., 2023).

Sidenreng Rappang (Sidrap), one of the regencies in South Sulawesi Province, holds significant potential for MSME development. This is reflected in the strong public interest in entrepreneurship. According to data from the Central Statistics Agency (BPS) in 2023, out of 136,946 individuals in the labor force, 80,370 or 58.68% chose self-employment as their main occupation. The most popular type of business is micro-scale culinary enterprises that sell food and beverages using container boxes,

evidenced by the widespread presence of such businesses in the city center of Pangkajenne.

However, MSMEs continue to face recurring challenges, particularly in the area of production cost control. Preliminary observations through informal interviews with several food and beverage MSME owners operating from container stalls revealed that many of them have not implemented structured production cost recording. Most do not separate costs related to raw materials, labor, and operational expenses, making it difficult to determine the actual total production cost and profit margins. This lack of clarity hinders their ability to set accurate selling prices, manage cash flow, and assess production efficiency.

According to Juwita et al. in Dinda (2021), production cost control is generally a strategic effort to plan and manage production costs effectively and efficiently. When properly implemented, it enables MSME owners to monitor cash flow, control operational expenses, manage payables and receivables, set appropriate selling prices, and design measurable expansion strategies. However, achieving effective cost control is not instantaneous and requires consistent and gradual improvements.

One approach to addressing this issue is the application of the Kaizen concept, a Japanese philosophy that emphasizes continuous and sustainable improvement. This concept can be applied in any organizational setting, including MSMEs (Salida, A., 2021). Kaizen consists of five dimensions, commonly referred to as the 5S principles: *Seiri* (Sort), *Seiton* (Set in order), *Seiso* (Shine), *Seiketsu* (Standardize), and *Shitsuke* (Sustain/Discipline) (Pin, N.E.C. et al., 2022). Our previous study found that the implementation of Kaizen helped reduce the proportion of quality cost inefficiencies (Salida, A., 2021).

Thus, consistent implementation of the Kaizen concept can gradually enhance MSMEs' capacity to control production costs. However, realizing these benefits requires a sufficient level of financial literacy, which serves as a foundation for making sound financial decisions. Financial literacy refers to the knowledge and skills necessary to manage financial resources effectively and efficiently (Nopiyani, P.E., 2023). It is essential for MSME owners to possess this competency in order to make informed and strategic decisions in managing their finances (Dahrani, 2022).

Previous studies have examined aspects of production cost control, Kaizen implementation, and financial literacy. Sidik (2022) focused on cost analysis using the target costing method, while Samadhinata (2020) analyzed production cost control through responsibility accounting. Nugroho (2022) explored the application of Kaizen to enhance sales productivity, and Kusuma (2021) investigated the importance of financial literacy in sustaining MSME operations.

However, none of these studies have specifically explored the direct and indirect relationships among the three variables using a causal quantitative approach. Therefore, this research aims to fill this gap by analyzing the direct and mediated effects of Kaizen implementation and financial literacy on production cost control. This study is important as it provides empirical evidence on whether the consistent application of Kaizen can enhance cost control capabilities among culinary MSMEs—particularly when supported by strong financial literacy.

This study involves MSME owners operating micro-scale food and beverage businesses using container stalls located in the urban area of Pangkajenne, Sidenreng Rappang Regency. The findings are expected to serve as a foundation for

formulating more targeted policies and support programs for MSMEs in the region and in other areas with similar characteristics.

HYPOTHESES

The Influence of Kaizen Concept Implementation on Production Cost Control

MSMEs must be able to maximize all sources of revenue while minimizing their costs, particularly production costs. One effective approach to achieve this is by implementing the Kaizen concept, which emphasizes continuous improvement through small, incremental changes. This philosophy has been proven to bring about significant improvements in various organizations, including MSMEs (Rini, M.W., 2022).

Our previous research indicates that consistent and continuous implementation of the Kaizen approach in business operations can effectively reduce the proportion of quality-related cost inefficiencies (Salida, A., 2021).

H1: The implementation of the Kaizen concept has a positive and significant effect on production cost control.

The Influence of Financial Literacy on Production Cost Control

Financial literacy is an essential competency for MSME actors, as it equips them with the ability to make informed and effective financial decisions (Dahrani, 2022). Individuals with a high level of financial knowledge are more likely to make sound decisions and minimize financial problems, thereby improving their overall well-being (Nopiyani, P.E., 2023).

With adequate financial literacy, MSME owners can develop more structured and realistic financial planning, including budgeting, cash flow management, and cost control (Hutauruk, R.P.S., 2024).

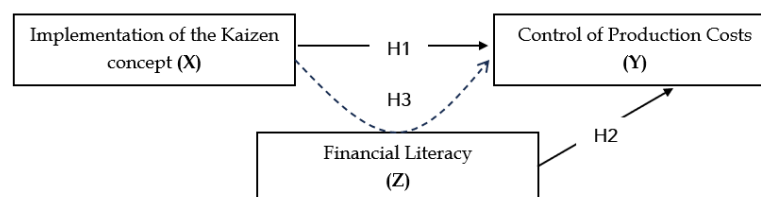
H2: Financial literacy has a positive and significant effect on production cost control.

The Influence of Kaizen Concept Implementation on Production Cost Control through Financial Literacy

Previous studies have shown that the consistent implementation of the Kaizen concept can improve cost control capabilities. However, this effectiveness is likely to be more optimal when supported by a strong level of financial literacy. Business actors who understand financial principles are generally more capable of planning, managing, and evaluating costs accurately and efficiently.

H3: The implementation of the Kaizen concept has a positive and significant effect on production cost control through financial literacy.

Figure 1. Conceptual Framework



METODOLOGY

This study was designed using a quantitative method with a descriptive approach, as it aims to examine the relationships between research variables and then describe them. According to Creswell as cited in (Patonah, I. et al., 2023), quantitative research involves collecting data, identifying variables, and measuring them numerically so that analysis can be conducted in accordance with applicable statistical procedures. Furthermore, descriptive quantitative research is a type of quantitative method aimed at presenting facts by describing what is observed, obtained, and experienced.

The data used in this study consisted of both primary and secondary sources. Primary data were collected directly by the researchers through the distribution of questionnaires to 100 respondents—MSME actors in the food and beverage sector located in the Pangkajene area, Sidenreng Rappang Regency—using purposive sampling. Meanwhile, secondary data were obtained from journals, books, the internet, and other relevant sources. The data analysis technique employed in this study was Partial Least Squares (PLS).

RESULT AND DISCUSSION

a. Respondent Description

1. Questionnaire Return Rate

A total of 100 MSME actors were selected as respondents based on predetermined criteria. The data collection process was carried out by distributing questionnaires through face-to-face interactions and asking respondents for their willingness to allocate time to complete them. However, out of the 100 questionnaires distributed, only 97 were usable for analysis, as 3 were incomplete.

Table 1. Questionnaire Return Rate

Description	Number
Questionnaires distributed	100
Questionnaires not returned	0
Incomplete questionnaires	(3)
Total usable questionnaires	97

Source: Processed primary data, 2024

2. Age of Respondents

The selected respondents naturally had diverse age ranges, as presented in the following table:

Table 2. Age of Respondents

Age (Years)	Frequency	Percentage
15-25	26	26.80
26-35	41	42.27
36-45	23	23.71
> 45	7	7.22
Total	97	100

Source: Processed primary data, 2024

It can be seen that respondents aged 26–35 years constituted the largest group, accounting for 42.27%. This was followed by the 15–25 age group at 26.80%, the 36–45 age group at 23.71%, and those over 45 years old at 7.22%. These findings indicate that the majority of MSME respondents were in their productive age, particularly within the 26–35 age range, which is generally considered an active phase for establishing and developing a business.

3. Level of Education

In addition to age, educational level is also an important characteristic in describing the respondents' profiles. Educational attainment can influence how MSME actors manage their businesses, understand financial concepts, and accept and apply innovations such as the Kaizen concept. Therefore, analyzing the respondents' educational level provides an initial overview of their cognitive capacity to run their businesses in a more structured and efficient manner.

Table 3. Level of Education Respondents

Education Level	Number	Percentage
Elementary School	8	8.25
Junior High School or Equivalent	14	14.43
Senior High School or Equivalent	39	40.21
Bachelor's Degree or Equivalent	27	27.84
Master's Degree or Equivalent	9	9.28
Total	97	100

Source: Processed primary data, 2024

The majority of respondents in this study had a senior high school or equivalent education level (40.21%), followed by bachelor's degree or equivalent (27.84%), junior high school or equivalent (14.43%), master's degree or equivalent (9.28%), and elementary school (8.25%). These data indicate that most MSME actors have attained at least a secondary education, which can serve as a valuable foundation for understanding concepts such as cost control, the implementation of the Kaizen concept, and financial literacy.

4. Length of Business Operation

In addition to age and educational level, the length of business operation is also an important indicator for understanding the characteristics of respondents. It reflects the level of experience MSME actors have in dealing with business dynamics, including how they manage production costs, implement efficiency strategies, and adapt to change. By identifying the duration of their business operations, we can better assess the extent to which respondents are capable of adopting continuous improvement concepts such as Kaizen.

Table 4. Length of Business Operation Respondents

Business Duration	Number	Percentage
≤ 5 Years	32	32.99
6-10 Years	39	40.21
11-15 Years	19	19.59

> 15 Years	7	7.22
Total	97	100

Source: Processed primary data, 2024

Based on the data, most respondents have been running their businesses for 6–10 years, totaling 39 individuals (40.21%), followed by those with ≤ 5 years of business experience (32 respondents or 32.99%), 11–15 years (19 respondents or 19.59%), and more than 15 years (7 respondents or 7.22%). These findings indicate that the majority of MSME actors possess a relatively mature level of business experience, particularly within the 6–10 year range, which reflects a strong potential for adapting to improvement strategies such as Kaizen.

b. Evaluation of the Measurement Model (Outer Model)

The purpose of the measurement model (outer model) assessment is to evaluate the indicators (manifest variables) in relation to the latent variables. Validity and reliability tests are conducted based on the output of the measurement model to ensure that the indicators are valid and reliable in measuring the respective latent constructs (Sayyida, 2023). To facilitate the data analysis process in this study, the SmartPLS 3 application was used. The results of the data processing are presented below.

1. Validity Test

1) Convergent Validity Test

In this study, validity testing includes both convergent and discriminant validity, where an indicator is considered valid if the factor loading value is greater than 0.70 and the Average Variance Extracted (AVE) exceeds 0.5 (Hair et al., 2019).

Table 5. Outer Loadings

Financial literacy	Implementation of the Kaizen concept	Control of production costs
X.1	0.495	
X.10	0.834	
X.12	0.800	
X.13	0.869	
X.14	0.827	
X.15	0.789	
X.2	0.746	
X.3	0.764	
X.4	0.743	
X.5	0.738	
X.6	0.447	
X.7	0.732	
X.8	0.451	
X.9	0.806	
Y.1		0.735

Y.2	0.757
Y.3	0.796
Y.4	0.747
Y.5	0.717
Y.6	0.741
Y.7	0.769
Y.8	0.752
Y.9	0.757
Z.1	0.861
Z.10	0.704
Z.11	0.776
Z.12	0.712
Z.2	0.861
Z.3	0.836
Z.4	0.817
Z.5	0.763
Z.6	0.710
Z.7	0.717
Z.8	0.763
Z.9	0.729

Source: Source: PLS Output, 2024

The figure shows that several indicators have factor loading values below 0.70, specifically X.1, X.6, and X.8. To obtain optimal data analysis results, these indicators were removed as they were considered invalid.

Figure 2. Construct Realibility and Validity

Construct Reliability and Validity				
	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Control of production costs	0.904	0.904	0.922	0.566
Financial literacy	0.939	0.950	0.947	0.598
Implementation of the Kaizen concept	0.946	0.956	0.953	0.651

Source: Source: PLS Output, 2024

After the indicators with factor loading values below 0.70 were removed, the validity test was repeated. The results based on the PLS output indicate that the Average Variance Extracted (AVE) values for all three variables exceed 0.50. Therefore, it can be concluded that the outer model has met the criteria for convergent validity.

2) Discriminant Validity Test

An indicator is considered to have discriminant validity if the heterotrait-monotrait (HTMT) ratio correlation is less than 0.85, and the cross-loading values show that the indicator's loading on its associated latent variable is greater than its loadings on other latent variables (Hair et al., 2019).

Fomell-Larcker Criterion	Cross Loadings	Heterotrait-Monotrait Ratio (HTMT)		
Control of production costs			Control of production costs	Financial literacy
Financial literacy			0.513	
Implementation of the Kalzen concept			0.401	0.432

The figure shows that all heterotrait-monotrait (HTMT) ratio correlation values are below 0.85. Furthermore, the cross-loading values are presented in the following table for further evaluation.

	Financial Literacy	Implementation of the Kaizen Concept	Control of Production Costs
X.10	0.427	0.861	0.348
X.12	0.393	0.844	0.390
X.13	0.433	0.910	0.347
X.14	0.429	0.862	0.303
X.15	0.427	0.832	0.282
X.2	0.300	0.739	0.255
X.3	0.303	0.766	0.291
X.4	0.316	0.749	0.226
X.5	0.165	0.737	0.256
X.7	0.286	0.727	0.251
X.9	0.317	0.823	0.347
Y.1	0.366	0.271	0.730
Y.2	0.372	0.276	0.753
Y.3	0.315	0.290	0.792
Y.4	0.305	0.338	0.747
Y.5	0.400	0.300	0.720
Y.6	0.377	0.278	0.746
Y.7	0.402	0.195	0.773
Y.8	0.373	0.299	0.753
Y.9	0.321	0.302	0.757
Z.1	0.860	0.468	0.451
Z.10	0.710	0.291	0.352
Z.11	0.780	0.276	0.338
Z.12	0.715	0.248	0.338
Z.2	0.861	0.494	0.456
Z.3	0.834	0.448	0.369
Z.4	0.815	0.429	0.367
Z.5	0.759	0.344	0.346
Z.6	0.706	0.196	0.348
Z.7	0.715	0.221	0.353
Z.8	0.763	0.246	0.338
Z.9	0.733	0.237	0.355

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The table indicates that each indicator's factor loading on its corresponding latent variable is greater than its loadings on other latent variables. Therefore, it can be concluded that the outer model has also satisfied the criteria for discriminant validity.

2. Realibility Test

Subsequently, reliability testing was conducted using internal consistency reliability, referring to the values of Cronbach's Alpha (CA), Composite Reliability (CR), and rho_A, all of which must exceed 0.70 (Hair et al., 2019). The results of the reliability test are presented in the following figure.

Figure 4. Construct Realibility and Validity

Construct Reliability and Validity				
	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Control of production costs	0.904	0.904	0.922	0.566
Financial literacy	0.939	0.950	0.947	0.598
Implementation of the Kaizen concept	0.946	0.956	0.953	0.651

Source: Source: PLS Output, 2024

Figure 4 shows that the values of Cronbach's Alpha (CA), Composite Reliability (CR), and rho_A for all three latent variables are greater than 0.70. Therefore, it can be concluded that the outer model has also met the reliability criteria. This indicates that all indicators are valid and reliable in measuring their respective latent variables (Sayyida, 2023).

c. Evaluation of the Structural Model

After all indicators were confirmed to be valid and reliable in measuring their respective latent variables, the next step was to conduct an evaluation of the structural model.

1. Coefficient of Determination Test R²

Table 7. R Square

	R Square	R Square Adjusted
Control Of Production Costs	0.264	0.248

Source: Source: PLS Output, 2024

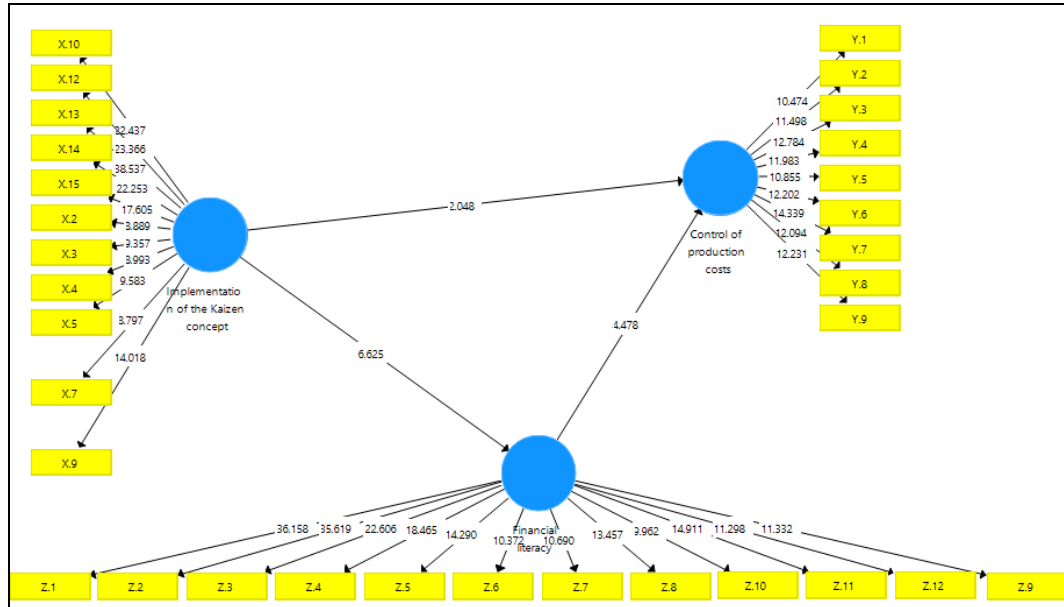
The higher the R² coefficient of determination, the greater the contribution of the sample in explaining the model (Sayyida, 2023). In other words, it is used to evaluate how much variation in the dependent variable can be explained by variations in the independent variables within the path model (Saragih, F., 2023).

The obtained Adjusted R Square value is 0.248. This indicates that the ability of food and beverage MSME actors in Pangkajenne City to control production costs can be explained by the implementation of the Kaizen concept, mediated by financial literacy. In other words, these two variables contribute 24.8% to the improvement of production cost control capability.

2. Hypothesis Testing

This hypothesis testing was conducted based on the results of the inner model assessment (Sekarsari, A., 2021). The results of both direct and indirect hypothesis testing are presented in the following figure.

Figure 5. Bootstrapping Rresult



Source: Source: PLS Output, 2024

Table 8. Hypothesis Testing Result

Hipotesis	Original Sample	Sample Mean	Standar Deviation	T Statistics	P Value
Implementation of the Kaizen Concept → Control of Product Costs	0.205	0.196	0.100	2.048	0.041
Financial Literacy → Control of Product Costs	0.389	0.397	0.087	4.478	0.000
Implementation of the Kaizen Concept → Financial Literacy → Control of Product Costs	0.172	0.185	0.052	3.291	0.001

Source: Source: PLS Output, 2024

1) Dirrect Effect Test

H1: The implementation of the Kaizen concept has a positive and significant effect on production cost control.

Based on Table 8, which presents the hypothesis testing results, the path coefficient for the effect of Kaizen concept implementation on production cost control is 0.205, with a T-Statistic value of 2.048 (greater than the T-table value of 1.96) and a P-Value of 0.041 (less than 0.05). This indicates that the implementation of the Kaizen concept has a positive and significant effect on production cost control; therefore, the first hypothesis is accepted.

H2: Financial literacy has a positive and significant effect on production cost control.

In the same table, the path coefficient for the effect of financial literacy on production cost control is 0.389, with a T-Statistic value of 4.478 (greater than the T-table value of 1.96) and a P-Value of 0.000 (less than 0.05). This also indicates that financial literacy has a positive and significant effect on production cost control; therefore, the second hypothesis is also accepted.

2) Indirect Effect Test

H3: The implementation of the Kaizen concept has a positive and significant effect on production cost control through financial literacy.

Table 8 also shows that the indirect effect of Kaizen concept implementation on production cost control through financial literacy has a path coefficient of 0.172, with a T-Statistic value of 3.291 (greater than the T-table value of 1.96) and a P-Value of 0.001 (less than 0.05). This indicates that the implementation of the Kaizen concept has a significant effect on production cost control through financial literacy. Therefore, the third hypothesis is accepted.

d. Discussion

1) The implementation of the Kaizen concept has a positive and significant effect on production cost control.

Kaizen, as a continuous improvement method, enables MSME actors to organize work processes, improve material efficiency, and standardize operations, all of which directly contribute to cost savings. However, in order to experience these benefits, MSME actors must implement the concept consistently, as the results are not immediately visible. This is because Kaizen is inherently designed for gradual improvements that begin with small changes. These findings reinforce the evidence that applying the 5S principles of Kaizen can serve as a foundational step toward enhancing cost efficiency, even at the micro and small enterprise level. This study also aligns with our previous research, which found that consistent and continuous implementation of Kaizen can reduce the proportion of quality-related cost inefficiencies (Salida, A., 2021).

2) Financial literacy has a positive and significant effect on production cost control.

Financial literacy enables MSME actors to understand and apply fundamental principles of financial management, such as budgeting, cost recording, and cash flow monitoring. With this knowledge, business owners can set more accurate selling prices, identify inefficiencies, and make data-driven financial decisions. This is entirely logical, considering that effective cost control—particularly production cost control—requires internal financial management skills, especially in prioritizing and classifying various types of costs. This study is also supported by previous research, which found that MSME owners with strong financial literacy are able to develop more

structured and realistic financial plans, including budget allocation, cash flow management, and cost control (Hutauruk, R.P.S., 2024).

3) The implementation of the Kaizen concept has a positive and significant effect on production cost control through financial literacy.

Although Kaizen can have a direct impact on cost efficiency, the maximum benefit of implementing the Kaizen concept can only be achieved if MSME actors also possess a high level of financial literacy. This is because financial literacy serves as an enabler that translates operational improvements (through Kaizen) into tangible cost efficiency. Kaizen may encourage MSMEs to sort raw materials, organize workflows, or establish cleanliness standards; however, without the ability to classify costs such as materials, labor, and margin calculations, these improvements are difficult to quantify financially. This is where financial literacy plays a crucial role—it connects physical and operational improvements to financial reports that reflect cost efficiency. Thus, financial literacy becomes a vital bridge between Kaizen implementation and the effectiveness of cost control, enabling business owners to measure, evaluate, and optimize every improvement effort in a structured, data-driven manner. This is further supported by the stronger indirect effect observed when the Kaizen concept influences MSME production cost control through the mediation of financial literacy, compared to its direct effect alone.

CONCLUSION

Based on the findings from 97 food and beverage MSME actors in Pangkajenne City, it can be concluded that the implementation of the Kaizen concept has a positive and significant effect on production cost control. As a continuous improvement approach, Kaizen helps business actors streamline work processes, enhance material efficiency, and standardize production activities, all of which contribute to cost efficiency. In addition, financial literacy also has a positive and significant effect on production cost control. MSME owners with strong financial knowledge—such as budgeting, cost recording, and cash flow management—are more capable of effectively controlling costs. A key finding of this study is that financial literacy significantly mediates the relationship between Kaizen implementation and production cost control. This means that the impact of Kaizen is maximized when supported by adequate financial literacy. Financial literacy enables MSME actors to translate operational improvements into measurable and tangible cost efficiencies. Overall, this study concludes that the combination of Kaizen implementation and financial literacy forms an effective strategy for enhancing production cost control and serves as a crucial foundation for designing more targeted and sustainable MSME support programs.

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