



The Effectiveness of Budget Simulation Training in Improving Budget Preparation and Control Capabilities in MSMEs: The Role of Management Accounting Mediation

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Abstract

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in economic development; however, many face high failure rates due to weak financial management capabilities, particularly in budgeting and financial control. Limited understanding of systematic budgeting and the lack of practical financial training hinder MSME actors from effectively planning and monitoring their financial resources. Therefore, strengthening budgeting competencies through structured training interventions is essential to enhance MSMEs' financial sustainability. This study aims to examine the effectiveness of budget simulation training in improving budgeting preparation and control capabilities among MSME actors, while also considering the mediating role of management accounting practices. A quantitative approach was employed using a one-group pretest-posttest quasi-experimental design. The sample consisted of 112 MSME actors selected through purposive sampling. Data were collected through questionnaires administered twice: before the training and four weeks after the intervention. Data analysis was conducted using paired sample t-tests and Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 4.0. The results indicate that budget simulation training has a positive and significant effect on budgeting skills ($\beta = 0.347$) and management accounting practices ($\beta = 0.642$). Management accounting practices also significantly influence budgeting skills ($\beta = 0.468$). Furthermore, management accounting practices partially mediate the relationship between training and budgeting skills, with a variance accounted for of 46.4%. These findings suggest that MSME capacity-building programs should integrate simulation-based budgeting training with guidance on the implementation of management accounting systems. This study contributes by integrating Experiential Learning Theory, Contingency Theory, and the Resource-Based View into a unified framework and empirically examining the mediating role of management accounting practices in MSME budgeting training in Indonesia.

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in the global economy as key drivers of economic growth, employment generation, and catalysts for innovation and entrepreneurship (Mahfud, 2025). Recent global estimates indicate that MSMEs account for nearly

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90% of all businesses, provide employment for more than 70% of the workforce, and contribute approximately 50% to global Gross Domestic Product (GDP) (Maharaj & Doorasamy, 2024). In Indonesia, their role is even more significant, contributing more than 60% of the national GDP and absorbing around 97% of the workforce (Corporation, 2025). These figures underscore the critical importance of MSMEs not only as economic actors but also as pillars of socio-economic stability.

Despite their substantial contribution, MSMEs face persistently high failure rates. Empirical evidence shows that more than 50% of Indonesian MSMEs fail within their first year of operation, while over 30% go bankrupt within the first two years (Evinita et al., 2025). Similar patterns are observed in other developing economies. In Malaysia, for example, more than 60% of newly established MSMEs fail within five years (Sylvia et al., 2020b), while in South Africa the failure rate reaches 70–80% within the same period (Maharaj & Doorasamy, 2024). Table 1 summarises MSME failure rates across several countries.

Table 1. Failure Rates of MSMEs in Various Countries

Country	Failure Rate	Period	Source
Indonesia	>50%	Year-1	(Wibowo et al., 2025)
Malaysia	>60%	Year-5	(Sylvia et al., 2020a)
Uganda	>30%	Year-3	(Adu-Gyamfi & Chipwere, 2023)
Amerika Serikat	48%	Year-5	(Labor., 2024)
Afrika Selatan	70-80%	Year-5	(Maharaj & Doorasamy, 2024)

Source: Compiled from various sources (2025)

The data in Table 1 demonstrate that high MSME failure rates are not confined to a specific country but represent a structural challenge across economies. Although multiple factors contribute to business failure, prior studies consistently identify weak financial management capabilities as a critical determinant (Otoo, 2024). Among these, budgeting plays a central role because it integrates planning, coordination, and control processes within organisations. Unlike financial tools that focus on past performance, budgeting provides a forward-looking mechanism that enables entrepreneurs to allocate resources efficiently, anticipate financial constraints, and monitor operational performance (Krisnadewi et al., 2023).

Several studies emphasise that inadequate budgeting practices are closely associated with poor business sustainability and financial instability. Businesses lacking structured budgeting processes often struggle to manage cash flow, control operational costs, and make strategic financial decisions, thereby increasing the risk of failure (Dasanayaka et al., 2021; Otoo, 2024). This challenge is more pronounced in MSMEs due to limited financial resources, simplified organisational structures, and centralised decision-making (Ylä-Kujala et al., 2023). These characteristics often result in informal financial management practices, limited use of management accounting tools, and inadequate budget planning and monitoring mechanisms. Consequently, strengthening budgeting capabilities among MSME actors becomes a crucial step in improving their financial resilience and long-term sustainability (Zuhroh et al., 2025).

In response, training interventions are widely recognised as effective strategies for enhancing managerial competencies and organisational capabilities. Training not only improves technical knowledge but also facilitates behavioural and cognitive changes that support better decision-making (Geerts, 2024). Within the context of financial management, training can equip MSME actors with the practical skills required to design, implement, and evaluate budgeting systems. However, conventional training approaches that rely heavily on lectures or theoretical explanations often fail to translate knowledge into practical managerial skills.

Experiential Learning Theory (ELT), developed by Kolb (1984), provides an important pedagogical framework for addressing this limitation. ELT posits that effective learning occurs through a cyclical process involving concrete experience, reflective observation, abstract conceptualisation, and active experimentation. Recent developments in experiential learning research further emphasise that active participation and contextualised learning environments significantly enhance knowledge retention and skill development (Morris, 2020). In this context, simulation-based learning methods have emerged as a promising educational approach. Business simulations allow participants to experience realistic decision-making situations, evaluate the consequences of their actions, and refine their managerial strategies in a risk-free environment (Lin et al., 2022). For MSME actors, budget simulation training can provide a practical platform for

learning how to prepare budgets, allocate resources, and monitor financial performance without exposing their businesses to real financial risks (Daniels et al., 2025).

While training interventions can improve managerial knowledge, the translation of this knowledge into improved organisational practices depends on the adoption of appropriate management accounting systems. Management accounting plays a critical role in supporting planning, control, and performance evaluation processes within organisations. Previous studies demonstrate that the adoption of management accounting practices, including budgeting systems, cost control mechanisms, and performance measurement tools, contributes significantly to organisational effectiveness and financial performance (Humaidi et al., 2025). However, the implementation of management accounting in MSMEs remains relatively limited due to resource constraints, limited technical expertise, and lack of awareness among business owners (Ylä-Kujala et al., 2023).

The relationship between training interventions, management accounting adoption, and budgeting capability can be understood through the lens of contingency theory. Contingency theory in management accounting suggests that the effectiveness of management control systems depends on their alignment with organisational context, including size, structure, technology, and environmental uncertainty (Chenhall, 2003; Otley, 2016). In the context of MSMEs, training interventions may enhance budgeting capabilities only when the acquired knowledge is integrated into management accounting practices that fit the organisational environment. From a broader strategic perspective, the Resource-Based View (RBV) provides additional theoretical justification for this relationship. RBV argues that organisational performance is determined by the possession and development of valuable, rare, and difficult-to-imitate resources, including managerial knowledge and capabilities (Dasanayaka et al., 2021). Training programs can therefore be viewed as mechanisms for developing internal capabilities that enhance organisational competitiveness. When combined with appropriate management accounting systems, these capabilities can evolve into dynamic capabilities that enable MSMEs to adapt to changing market conditions and maintain sustainable performance.

Despite the growing body of literature on financial management and MSME performance, several important research gaps remain. First, existing studies on budgeting in small businesses are geographically concentrated in developed economies, with relatively limited empirical evidence from Southeast Asia. Azhar and Syarif (2025), in a systematic review of 137 Scopus-indexed publications, highlight the existence of regional representation gaps, particularly concerning developing countries, in budgeting research. Second, although previous studies have demonstrated the importance of financial management practices for organisational performance, the underlying mechanisms through which these practices influence managerial capabilities remain insufficiently explored (Otoo, 2024). Third, the relationship between management accounting adoption and MSME performance has rarely been examined through structured intervention-based studies. Most existing research relies on cross-sectional survey methods, which limits the ability to establish causal relationships (Ylä-Kujala et al., 2023). Finally, the integration of multiple theoretical perspectives to explain how training interventions translate into improved organisational capabilities remains underdeveloped in the literature (Roffia & Dabić, 2024).

In response to these gaps, this study offers several novel contributions. First, it empirically tests the effectiveness of budget simulation training for MSME actors in Indonesia using a quasi-experimental design, providing stronger causal evidence compared to the predominantly survey-based approaches used in previous studies. Second, this study develops and examines a mediation model in which management accounting practices serve as a mechanism linking training interventions to improvements in budgeting capability. Third, this research integrates Experiential Learning Theory, Contingency Theory, and the Resource-Based View into a unified conceptual framework to explain how experiential training can develop managerial capabilities through the adoption of appropriate management accounting practices. Based on this framework, the present study aims to examine the effectiveness of budget simulation training in improving budget preparation and control capabilities among MSME actors, while also analysing the mediating role of management accounting practices in transforming training outcomes into practical financial management capabilities.

METHOD

The study employed a one-group pretest–posttest design without a control group due to practical and ethical constraints, including the need to provide the intervention to all participants, as well as limitations in time, resources, and participant availability. However, this design weakens internal validity, as it is difficult to attribute observed improvements solely to the intervention. Potential threats include history effects, maturation, testing effects, instrumentation changes, and statistical regression. As a result, while the findings provide preliminary evidence of effectiveness, they should be interpreted with caution. Future studies are therefore recommended to include a control group to strengthen causal inferences. This design was selected because it allows for the evaluation of training interventions in a natural setting while enabling researchers to observe changes in participants' competencies before and after the intervention (Hossan et al., 2023). In this approach, participants' budgeting capability and management accounting practices were measured prior to the intervention (pretest) and again after the intervention (posttest). The difference between these measurements was used to assess the effectiveness of the budget simulation training.

Population and Sample

The research population consisted of MSME actors registered at the Cooperative and MSME Office in the research area. The sample was selected using purposive sampling to ensure that the participants met specific criteria relevant to the study objectives. The inclusion criteria were as follows:

1. MSMEs that had been operating for at least two years to ensure business stability.
2. Businesses with an annual turnover between IDR 50 million and IDR 2.5 billion, in accordance with the classification of MSMEs under Law No. 20/2008.
3. Willingness to participate in the budget simulation training program.
4. Participants who had not received formal budgeting training in the previous two years.

The required sample size was calculated using G*Power 3.1, assuming a medium effect size ($f^2 = 0.15$), significance level $\alpha = 0.05$, and statistical power 0.80. Following recommendations for Partial Least Squares Structural Equation Modelling (PLS-SEM) (Hair et al., 2019), the minimum sample requirement was estimated at 120 MSMEs

Research Variables and Measurement

This study examined three main variables: budget simulation training, management accounting practices, and budgeting capability. These variables were selected to understand how training interventions influence the development of budgeting skills among MSME actors and how management accounting practices mediate this relationship.

Budget Simulation Training (Independent Variable)

Budget simulation training represents the intervention variable designed to improve participants' budgeting knowledge and practical skills. The training program was developed based on the principles of experiential learning, emphasizing learning through practical experience and active participation. The training was conducted over three days, totaling 24 effective hours, and consisted of three main modules. The first module introduced fundamental budgeting concepts in small business management. The second module focused on budget preparation simulations, including revenue forecasting, cost estimation, and cash flow planning. The third module emphasized budget monitoring and control exercises, particularly variance analysis and corrective actions. During the training sessions, participants worked with simulated financial scenarios designed to resemble real operational conditions of micro, small, and medium enterprises (MSMEs), allowing them to practice budgeting techniques in realistic business situations.

Management Accounting Practices (Mediating Variable)

Management accounting practices refer to the extent to which MSME actors implement management accounting tools and techniques in their business operations. This variable was measured using 15 items adapted from the instruments developed by Sanna Ylä-Kujala et al. (2023).

The measurement instrument covers several aspects of management accounting implementation, including budget planning practices, cost recording and analysis, financial performance monitoring, and the use of accounting information for decision-making. These dimensions reflect how MSME actors utilize accounting information to support managerial decisions and improve financial management within their businesses (Kotronoulas et al., 2023).

Budgeting Capability (Dependent Variable)

Budgeting capability represents the ability of MSME actors to prepare, implement, and control business budgets effectively. This variable was measured using 18 items adapted from the instruments developed by Matsoso et al. (2021) and Samuel Otoo (2024). The measurement dimensions include budget planning and preparation, financial forecasting accuracy, budget monitoring and control, as well as budget evaluation and corrective actions. These dimensions capture the comprehensive capability of MSME actors in managing budgeting processes in their businesses. All measurement items in this study were assessed using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This scale allows respondents to express the extent of their agreement with each statement, thereby providing a quantitative assessment of the constructs examined in the study.

Research Instrument Development

The research instrument was developed through a multi-stage process to ensure validity and reliability. First, measurement items were adapted from previously validated instruments in the management accounting and SME literature. Second, the questionnaire was reviewed by two academic experts in accounting and SME management to assess content validity. Third, a pilot study involving 30 MSME actors was conducted to test the clarity, reliability, and preliminary validity of the instrument. The results of the pilot study indicated that all constructs met the recommended reliability threshold with Cronbach's Alpha values above 0.70, indicating acceptable internal consistency.

Research Procedure

The data collection process was conducted in four sequential stages. First, a pilot study was conducted to test the reliability and validity of the research instruments. Second, the pretest survey was administered one week before the training intervention to measure participants' baseline budgeting capability and management accounting practices. Third, participants attended the budget simulation training program, which lasted three days and involved interactive lectures, simulation exercises, and group discussions. Finally, the posttest survey was conducted four weeks after the training to allow participants time to apply the acquired knowledge in their business activities. To ensure ethical compliance, this study obtained ethical approval prior to data collection, and all participants provided written informed consent. Participant confidentiality was protected through the use of identification codes instead of personal names, following research ethics guidelines (Kotronoulas et al., 2023). The overall research procedure is illustrated in Figure 1.



Figure 1. Research Procedure Flowchart

Data Analysis

Data analysis was conducted using SPSS 26 and SmartPLS 4.0. SPSS was used to perform descriptive statistics and paired sample t-tests to evaluate changes in participants' budgeting capability before and after the intervention. SmartPLS 4.0 was used to test the measurement model and structural model using the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach. Measurement model evaluation included Convergent validity using Average Variance Extracted ($AVE > 0.50$) and outer loading (> 0.70), Discriminant validity using the Heterotrait-Monotrait ratio ($HTMT < 0.90$), and Reliability testing using Composite Reliability (> 0.70). Hypothesis testing was conducted using a bootstrapping procedure with 5,000 subsamples. A hypothesis was considered significant when t -statistics > 1.96 or p -values < 0.05 .

Mediation Analysis and Research Limitations

The mediation effect of management accounting practices was tested using the procedure proposed by Zhao et al. (2010). The significance of direct and indirect effects was examined using bootstrapping. In addition, the magnitude of the mediation effect was assessed using Variance Accounted For (VAF) to determine whether the mediation effect was partial or full mediation. Several limitations should be acknowledged. First, the one-group pretest–posttest design without a control group limits the ability to make definitive causal inferences. Second, the use of self-reported data may introduce social desirability bias, although this risk was mitigated through anonymity and confidentiality assurances. Third, the purposive sampling method restricts the generalisability of the findings to the broader MSME population. Finally, the four-week interval between training and posttest may not fully capture long-term behavioural changes, suggesting the need for future longitudinal studies.

RESULTS AND DISCUSSION

Results

120 MSMEs were invited to participate in the study, with 112 MSMEs completing all stages of data collection (response rate 93.3%), meeting the minimum requirements for PLS-SEM analysis. The characteristics of the respondents showed a representative distribution: based on business scale, 42% were micro, 38% were small, and 20% were medium; based on sector, 35% were in trade, 33% were in manufacturing, and 32% were in services; based on business age, the average was 5.7 years with a standard deviation of 2.8 years. The majority of respondents (68%) were business owners, while the rest (32%) were managers responsible for financial management. The respondents' education levels varied: high school/equivalent (28%), diploma (22%), bachelor's degree (42%), and postgraduate degree (8%).

The results of the validity and reliability testing of the research instrument are presented in Table 2. In PLS-SEM, several indicators are used to ensure that the measurement instrument is both valid and reliable. Average Variance Extracted (AVE) refers to the proportion of variance that a construct captures from its indicators relative to the variance due to measurement error; an AVE value above 0.50 indicates that the construct explains more than half of the variance of its items, supporting convergent validity. Composite Reliability (CR) measures the internal consistency of the indicators in representing a construct, similar to but more robust than Cronbach's Alpha, with values above 0.70 indicating good reliability. Cronbach's Alpha also assesses internal consistency, confirming that the items consistently measure the same construct. Additionally, the Heterotrait-Monotrait Ratio (HTMT) is used to assess discriminant validity, ensuring that different constructs are truly distinct from one another; HTMT values below the recommended threshold (commonly 0.85 or 0.90) indicate that constructs do not overlap excessively. Together, high AVE, CR, and Cronbach's Alpha values demonstrate that the instrument is reliable and consistently measures the intended constructs, while acceptable HTMT values confirm that each construct is empirically distinct, strengthening the overall validity of the measurement model. Discriminant validity was met with HTMT values for all construct pairs below 0.90. Common Method Bias (CMB) refers to systematic measurement error that arises when data for all variables are collected from the same source, at the same time, and using the same method (e.g., a single self-report questionnaire). This can artificially inflate or deflate the observed relationships among constructs, leading to biased results. One widely used approach to detect CMB in PLS-SEM is the full collinearity assessment using Variance Inflation Factor (VIF), as proposed by Kock. In this method, all constructs in the model are regressed on a common latent factor, and VIF values are calculated to assess the extent of collinearity among them. If CMB is present, it tends to increase correlations between constructs, which in turn inflates VIF values. A threshold of $VIF < 3.3$ is commonly used to indicate that collinearity and thus potential method bias is not a serious concern.

The use of full collinearity VIF is justified because it provides a simple and comprehensive diagnostic that simultaneously assesses both vertical (predictor-criterion) and lateral (construct-construct) collinearity within the model. Unlike traditional techniques such as Harman's single-factor test, which has been criticized for its low sensitivity, the full collinearity approach is more robust and suitable for PLS-SEM analysis. Therefore, obtaining VIF values below 3.3 across all constructs suggests that the data are not significantly affected by common method bias, supporting the credibility and validity of the study's findings.

Table 2. Validity and Reliability Test Results

Construct	AVE	CR	Alpha	VIF
Budget Simulation Training (X)	0,618	0,889	0,853	1,824
Management Accounting Practices (M)	0,573	0,923	0,908	2,156
Budgeting Skills (Y)	0,586	0,936	0,925	2,043
Criteria	> 0,50	> 0,70	> 0,70	< 3,30

Source: Processed primary data (2024)

The results of the paired sample t-test analysis showed a significant increase in both variables after the training intervention. To provide a clearer picture of the results beyond mean differences, a concise table can be included to summarize the pre-post test distribution:

Table 3. Pre-Post Test Distribution of Management Accounting Practice Scores

Statistic	Pre-Test	Post-Test
Mean	2.84	3.76
Standard Deviation	0.52	0.48
Minimum Score	1.90	2.80
Maximum Score	3.70	4.60
Sample Size (n)	30	30

Inferential Results: $t = 12.847$, $p < 0.001$, Cohen's $d = 1.21$ (large effect). This table allows readers to observe not only the increase in average scores but also the spread and range of the data, providing a more comprehensive understanding of the improvement in management accounting practices after the intervention. Budgeting ability scores increased from an average of 2.68 (pre-test) to 3.89 (post-test) with $t = 15.326$ ($p < 0.001$) and Cohen's $d = 1.45$ (large effect). These results indicate that the budget simulation training intervention successfully improved both management accounting practices and budgeting skills substantially. In the structural model, R^2 (coefficient of determination) indicates how much of the variance in an endogenous variable such as MSMEs' budgeting capability can be explained by the predictor variables in the model. An R^2 value of 0.587 means that 58.7% of the variation in budgeting capability is explained by factors included in the study (e.g., management accounting practices and training), which suggests a moderate to substantial level of explanatory power. Similarly, an R^2 of 0.412 for management accounting practices indicates that the model explains 41.2% of its variance, reflecting a moderate level of prediction. In practical terms, higher R^2 values imply that the model has stronger ability to explain why differences in MSMEs' budgeting capability occur.

Meanwhile, Q^2 (predictive relevance) assesses how well the model can predict observed data through a blindfolding procedure. Unlike R^2 , which focuses on explanation, Q^2 evaluates the model's out-of-sample predictive capability. Q^2 values greater than zero indicate that the model has predictive relevance for a particular construct. In this case, Q^2 values of 0.298 (for management accounting practices) and 0.385 (for budgeting capability) suggest that the model has good predictive accuracy and is capable of reliably forecasting MSMEs' budgeting capability. Together, the R^2 and Q^2 results indicate that the model is not only adequate in explaining relationships among variables but also useful for predicting real-world outcomes, strengthening the overall validity and practical applicability of the findings. The results of hypothesis testing using 5,000 subsample bootstrapping are presented in Table 4.

Table 4. Hypothesis Testing Results

H	Track	β	t-value	p-value	Decision
H1	X → Y	0,347	4,128	< 0,001	Accepted
H2	X → M	0,642	9,856	< 0,001	Accepted
H3	M → Y	0,468	5,724	< 0,001	Accepted
H4	X → M → Y (Mediasi)	0,300	4,892	< 0,001	Accepted

Description:

X = Budget Simulation Training;

M = Management Accounting Practice;

Y = Budgeting Skills.

Based on Table 3, all research hypotheses were accepted. H1 shows that budget simulation training has a positive and significant effect on budgeting skills ($\beta = 0.347$; $t = 4.128$; $p < 0.001$). H2 confirms the positive effect of training on management accounting practices ($\beta = 0.642$; $t = 9.856$; $p < 0.001$), with the highest path coefficient in the model. H3 shows that management accounting practices have a positive effect on budgeting ability ($\beta = 0.468$; $t = 5.724$; $p < 0.001$). The f^2 effect size indicates how strongly each exogenous variable contributes to explaining changes in an endogenous variable, beyond what is already explained by other variables in the model. In practical terms, it helps translate statistical relationships into meaningful impacts on MSMEs' budgeting capability. The X→M path ($f^2 = 0.412$, large effect) suggests that the intervention (e.g., training) has a substantial influence

on improving management accounting practices. This means that changes in the training variable lead to considerable improvements in how MSMEs apply accounting practices in their operations.

Furthermore, the M→Y path ($f^2 = 0.263$, moderate to large effect) indicates that better management accounting practices significantly enhance budgeting capability. In practice, this implies that when MSMEs adopt more structured and systematic accounting practices, they are able to plan, allocate, and control their budgets more effectively. Meanwhile, the direct X→Y path ($f^2 = 0.145$, moderate effect) shows that the intervention also has a meaningful, though smaller, direct impact on budgeting capability even without going through the mediator. Taken together, these effect sizes suggest a clear improvement scale: the intervention primarily drives change by strongly improving management accounting practices, which in turn leads to notable gains in budgeting capability, with an additional direct contribution. Practically, this means that MSMEs are likely to experience moderate to substantial improvements in their budgeting performance such as better cost planning, more accurate financial projections, and improved financial control as a result of the intervention.

Table 4. Effect Size (f^2) of Structural Model

Path Relationship	f^2 Value	Effect Size Category
X → Y	0.145	Moderate
X → M	0.412	Large
M → Y	0.263	Moderate to Large

The mediation effect test (H4) shows that the indirect effect of budget simulation training on budgeting skills through management accounting practices is significant ($\beta = 0.300$; $t = 4.892$; $p < 0.001$). The total effect of training on budgeting skills is 0.647 (direct effect 0.347 + indirect effect 0.300). The Variance Accounted For (VAF) calculation yields a value of 46.4% ($0.300/0.647$), indicating partial mediation. Since both the direct effect (H1) and indirect effect (H4) are significant in the same direction (positive), the type of mediation is complementary partial mediation. The Variance Accounted For (VAF) is used to determine the extent to which a mediating variable explains the relationship between an independent and a dependent variable. It is calculated as the proportion of the indirect effect relative to the total effect. In mediation analysis, commonly accepted thresholds suggest that $VAF < 20\%$ indicates no mediation, $20\%–80\%$ indicates partial mediation, and $> 80\%$ indicates full mediation. Therefore, a VAF value of 46.4% falls within the partial mediation range, meaning that management accounting practices explain a substantial but not complete portion of the effect of budget simulation training on budgeting ability.

In practical terms for MSMEs, this finding implies that the training improves budgeting capability through two pathways. First, nearly half of the improvement (46.4%) occurs indirectly by enhancing management accounting practices such as better record-keeping, cost analysis, and financial planning which then lead to stronger budgeting skills. Second, the remaining effect occurs directly, meaning that the training itself also improves budgeting ability without necessarily passing through changes in accounting practices (e.g., through increased knowledge or awareness). This highlights that while strengthening management accounting practices is a key mechanism for improving budgeting capability, it is not the only pathway. For MSMEs, this suggests that training programs should both reinforce practical accounting skills and directly build budgeting competencies to achieve optimal results.

Discussion

This study confirm that budget simulation training has a positive and significant effect on the ability to prepare and control budgets in MSMEs (H1 accepted). To make the link with Experiential Learning Theory (ELT) more concrete, the training activities can be mapped onto its four learning stages as follows:

1. Concrete Experience (doing/feeling)

Participants engage in hands-on budgeting simulations, such as preparing a simple business budget for their own MSME, recording transactions, or managing cash flow in a simulated scenario. For example, they may be given a case of a small business and asked to allocate limited resources across production, marketing, and operations.

2. **Reflective Observation (reviewing/reflecting)**
After the activity, participants review their results and discuss what happened. They may compare their budgets with others, identify mistakes (e.g., underestimating costs or overestimating revenue), and reflect on challenges faced during the simulation.
3. **Abstract Conceptualization (thinking/conceptualizing)**
Facilitators then introduce key concepts of management accounting and budgeting, such as cost classification, break-even analysis, or budgeting principles. Participants connect their practical experiences with these theoretical concepts, helping them understand why certain decisions led to better or worse outcomes.
4. **Active Experimentation (applying/doing)**
Finally, participants apply what they have learned by revising their budgets or creating new ones for their actual businesses. They may test improved strategies, such as more accurate cost estimation or better financial planning, and prepare to implement these practices in real MSME operations.

These concrete activities show how the training moves beyond theory by guiding MSME participants through a cycle of experience, reflection, understanding, and application, thereby strengthening both management accounting practices and budgeting capability (Villarroel Henríquez et al., 2025). Budget simulation provides MSME practitioners with the opportunity to experience a complete learning cycle: experiencing realistic budgeting situations, reflecting on the results of decisions, conceptualising budgeting principles, and experimenting with new strategies (Farran, 2023). These findings are consistent with prior research demonstrating that training is positively associated with job performance and that experiential learning approaches, including business simulations, enhance understanding of managerial decision-making processes (Salas et al., 2012; Kolb, 1984). The substantial path coefficient ($\beta = 0.347$) indicates that simulation-based training is more effective than conventional methods in developing budgeting competencies, as argued by Morris (2020) regarding the advantages of experiential learning.

The effect of budget simulation training on management accounting practices (H2) shows the highest path coefficient in the model ($\beta = 0.642$), indicating that training has the strongest impact in encouraging the adoption of management accounting practices. This finding supports the Resource-Based View perspective (Barney, 1991) that training is an investment in human resource development that produces organisational capabilities. Simulation training not only transfers technical budgeting knowledge but also builds an understanding of the importance of a comprehensive management accounting system. These results are consistent with Ylä-Kujala et al. (2023), who found that the main challenge to the adoption of management accounting in small businesses is a lack of knowledge and skills, which can be overcome through appropriate training interventions. The large effect ($f^2 = 0.412$) indicates that simulation training is a strong predictor of the implementation of management accounting practices in SMEs.

The significant effect of management accounting practices on budgeting capabilities ($\beta = 0.468$) can be clearly understood when linked to the context of MSMEs in Indonesia. In many Indonesian MSMEs, financial management is often informal, with limited use of structured accounting systems, low financial literacy, and reliance on intuition in decision-making. Within this context, Contingency Theory suggests that management control systems such as budgeting and accounting practices become effective only when they are aligned with the specific conditions and needs of the business. The empirical finding implies that when MSMEs begin to adopt more appropriate and structured management accounting practices such as systematic record-keeping, cost tracking, and simple financial reporting, they significantly improve their ability to prepare and manage budgets. This alignment is particularly relevant in Indonesia, where MSMEs operate in diverse environments, ranging from micro-scale family businesses to growing small enterprises facing market competition and financial constraints. For example, a small food business that starts recording daily expenses and revenues is better able to estimate future costs and allocate resources efficiently, leading to more accurate and realistic budgeting.

Thus, the result ($\beta = 0.468$) reflects a practical reality: improving budgeting capability in Indonesian MSMEs is not merely about introducing generic financial tools, but about ensuring that accounting practices are tailored to their scale, capacity, and business environment. This finding

reinforces that context-sensitive adoption of management accounting practices is a key driver for strengthening financial management and sustainability among MSMEs in Indonesia. In the context of MSMEs, management accounting practices provide a structured information system that supports the budgeting process, including financial planning, monitoring of budget realisation, and performance evaluation. Through systematic recording and analysis of financial data, management accounting enables business owners to compare planned budgets with actual financial outcomes and identify deviations between expected and realised performance.

One of the key mechanisms through which management accounting enhances budgeting effectiveness is variance analysis. Variance analysis allows MSME actors to examine differences between budgeted and actual revenues or expenditures, thereby identifying operational inefficiencies, unexpected cost increases, or revenue shortfalls. By regularly monitoring these variances, business owners can take corrective actions such as adjusting cost structures, reallocating resources, or revising operational strategies. In addition, management accounting systems facilitate budget monitoring by providing timely financial reports and performance indicators that support ongoing evaluation of business activities. This information helps entrepreneurs maintain financial discipline and ensures that operational decisions remain aligned with predetermined financial plans.

These findings are consistent with previous studies demonstrating that the adoption of management accounting practices significantly improves organisational control and financial performance in SMEs. [Adu-Gyamfi and Chipwere \(2023\)](#) and [Gyamera et al. \(2023\)](#) found that management accounting systems enhance managerial decision-making by providing relevant and reliable financial information. Similarly, [Otoo \(2024\)](#) identified capital budgeting and working capital management as dominant components of SME financial management practices that contribute to improved financial stability. Taken together, these findings indicate that the development of appropriate management accounting systems is a critical prerequisite for effective budgeting practices in MSMEs, as it transforms budgeting from a simple planning tool into an integrated mechanism for financial control and strategic decision-making.

The findings of complementary partial mediation (VAF = 46.4%) provide an important theoretical contribution by explaining the mechanism of transmission of the influence of training on budgeting skills. These results indicate that training influences budgeting skills through two channels: directly through increased knowledge and skills ($\beta = 0.347$), and indirectly through improved management accounting practices ($\beta = 0.300$). This mediation mechanism is consistent with Dynamic Capabilities Theory, which explains how knowledge gained from training is transformed into operational capabilities through organisational routines and systems. These findings are consistent with previous studies showing that management accounting practices mediate the relationship between organizational capacity and firm performance ([Saleh & Al-Nimer, 2022](#)), and that accounting information systems serve as a mediator in the relationship between organizational strategy and performance ([Kareem et al., 2024](#)). The implication is that to maximise the impact of training, SMEs need to develop management accounting systems as a mechanism for institutionalising knowledge.

This study provides several theoretical implications. First, the integration of Experiential Learning Theory, Contingency Theory, and Resource-Based View provides a comprehensive framework for understanding the development of budgeting capabilities in MSMEs. Second, the identification of the mediating role of management accounting practices enriches our understanding of the mechanisms of training transfer in the context of MSMEs, which has been under-explored. Third, this study expands the budgeting literature, which has been dominated by the context of large companies, to the domain of MSMEs with their unique characteristics. For practical implications, the results of this study suggest that MSME capacity building programmes need to integrate simulation-based budgeting training with assistance in implementing management accounting systems. The government and MSME empowerment institutions can adopt this approach in programmes to improve MSME financial literacy.

LIMITATION

This study acknowledges several limitations that should be considered when interpreting the findings. First, the use of a one-group pretest–posttest quasi-experimental design without a control

group limits the ability to draw strong causal inferences regarding the effectiveness of the budget simulation training. Although the pretest–posttest comparison provides useful evidence of changes following the intervention, the absence of a comparison group makes it difficult to fully rule out alternative explanations such as external environmental influences or participants' independent learning processes. Nevertheless, the consistency of the results with the theoretical framework and prior empirical studies provides some support for the internal validity of the findings.

Second, the study relies on self-reported questionnaire data, which may be susceptible to response bias, including social desirability bias or overestimation of participants' competencies. To reduce this risk, several precautionary steps were implemented, including ensuring participant anonymity, using neutral wording in questionnaire items, and emphasizing that the data would be used solely for academic purposes. Despite these efforts, the potential for subjective bias cannot be entirely eliminated. Third, the four-week interval between the training intervention and the posttest measurement may not be sufficient to capture the long-term behavioural and organisational changes resulting from the training program. Improvements in budgeting capability and management accounting practices may require a longer period of implementation before their full effects become observable.

Based on these limitations, future research is recommended to adopt a more rigorous experimental design, such as a randomized controlled experiment involving both treatment and control groups, in order to strengthen causal inference. In addition, future studies could employ longitudinal research designs with multiple follow-up measurements (e.g., 3, 6, and 12 months after the intervention) to examine the sustainability of training outcomes. Further investigations may also incorporate moderating variables, such as owner characteristics, business age, and industry sector, to better understand contextual factors influencing training effectiveness. Finally, the use of objective performance indicators, such as forecasting accuracy and actual budget variance, together with a broader geographical scope, would enhance the robustness and generalisability of future findings.

CONCLUSION

This study examined the effectiveness of budget simulation training in improving the budgeting and budget control capabilities of MSMEs, while also analysing the mediating role of management accounting practices. The findings demonstrate that simulation-based training is an effective approach for strengthening the financial management capabilities of MSME actors. Specifically, the training intervention not only enhances participants' budgeting skills but also encourages the adoption of management accounting practices that support more structured planning and financial control processes. Furthermore, management accounting practices function as an important mechanism through which the knowledge gained from training is translated into practical budgeting capabilities. From a theoretical perspective, this study contributes to the literature by integrating Experiential Learning Theory, Contingency Theory, and the Resource-Based View into a unified conceptual framework. This integration provides a more comprehensive explanation of how experiential training interventions can transform managerial knowledge into operational capabilities within MSMEs through the adoption of appropriate management accounting practices.

From a practical standpoint, the findings highlight the importance of designing MSME capacity-building programs that combine simulation-based training methods with structured guidance on management accounting implementation. Such an integrated approach can help MSME actors develop more systematic budgeting practices, improve financial decision-making, and ultimately enhance business sustainability. This study provides empirical evidence that strengthening budgeting capability through experiential learning and management accounting adoption can play a significant role in improving MSME financial management practices. Future research is encouraged to employ more rigorous experimental designs, incorporate longitudinal measurements to examine the sustainability of training outcomes, and explore contextual factors that may influence the effectiveness of financial management interventions in MSMEs.

AUTHOR CONTRIBUTIONS

HAW conceived and designed the study, supervised the research process, and reviewed the manuscript. SFJ contributed to the development of research instruments, data collection, and implementation of the training program. WSMH conducted data analysis using SPSS and SmartPLS, and interpreted the results. WDS contributed to the literature review, manuscript drafting, and language editing.

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