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The Psychological Pathway to MSME Sustainability: Financial Literacy and Financial Efficacy

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ABSTRACT

Purpose – The purpose of this study is to examine the role of financial literacy and financial efficacy in building financial sustainability of MSMEs in Batam, Indonesia, where declining financial literacy rates and low entrepreneurial confidence may threaten MSMEs sustainability in the long term.
Design/methodology/approach – This study uses a quantitative method with 339 MSME owners and managers in Batam as respondent. Semi structured interviews with three MSME entrepreneurs were subsequently conducted solely to provide contextual explanations for the quantitative findings. The hypotheses were tested using partial least squares structural equation modeling (PLS-SEM) with SmartPLS.
Finding/Results – Financial attitude and financial knowledge were positively associated with financial literacy, while financial behavior does not. Financial literacy was positively associated with financial efficacy and financial sustainability, and financial efficacy mediates the relationship between financial literacy and financial sustainability.
Originality/Value – Rather than treating financial efficacy as an additional predictor, this study position it as the psychological mechanism through which financial literacy is translated into MSME sustainability. By integrating the theory of planned behavior and social cognitive theory. This study provides theoretical, contextual, and methodological contributions to the literature on financial sustainability.

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1. Introduction

MSMEs play a crucial role in promoting economic growth, creating employment opportunities, and supporting economic quality. Data from Kementerian Koperasi dan UMKM, MSME in Indonesia, has contributed around 60-61% towards the country's GDP and absorbed 117 million workers, or around 97% of the workforce, and more than 64 million units of MSMEs are recorded (Perbendaharaan, 2024). This contribution makes MSME the main sector in growing the country's economic growth. Although MSMEs play a crucial role in economic growth, most still face limitations in managing their business finances and in adapting to economic uncertainty. This condition is reflected in the high failure rate of MSMEs in maintaining sustainability. Therefore, MSME sustainability is crucial to examine, particularly in the face of increasingly complex, dynamic economies. One of the main problems faced by MSME owners is a lack of financial management, as some MSMEs combine personal and business finances, leading to inaccurate monitoring of financial performance and slowing the achievement of financial sustainability. Financial sustainability refers to a business's ability to survive in the long term and contributes to economic growth (Kurniasari et al., 2025). The majority of MSMEs face challenges such as poor cash flow management, limited access to funding, and limited access to capital. This condition threatens the existence of MSMEs. Therefore, strengthening MSMEs' financial position is crucial. Data from OJK (2025) showed that the financial literacy index for entrepreneurs in Indonesia in 2025 was 73.60%, down from 78.32% the previous year. Some entrepreneurs struggle with bookkeeping, financial planning, cash flow management, and financial responsibility. This condition shows that financial literacy among MSMEs is a problem that impedes achieving financial sustainability. Financial literacy is a person's attitude toward making quality financial decisions, shaped by knowledge, skills, and beliefs (OJK, 2024). A high level of financial literacy may help entrepreneurs make better decisions. However, financial literacy alone may not be sufficient to ensure MSME financial sustainability. In addition to limited financial literacy, financial efficacy, and entrepreneurs' self-confidence, financial sustainability is influenced by other factors as well. In many cases, entrepreneurs have basic knowledge of money management but struggle to apply it consistently, due to low self-confidence, fear of making mistakes in decision-making, and a tendency to procrastinate on strategic financial actions. Financial management practices such as consistent financial recording, budget evaluation, and formal financing decision-making require a higher level of self-confidence to implement them in a disciplined manner. Doubt and uncertainty in managing financial matters may lead to suboptimal financial practices, weakening MSMEs' ability to maintain long-term financial stability and sustainability. The concept of financial efficacy is derived from the theory of self-efficacy, as originally proposed by (Bandura, 2023). This theory holds that an individual's self-confidence in their ability to perform the necessary actions to achieve the desired result is crucial. In this case, financial efficacy reflects the level of confidence entrepreneurs have in their ability to manage their business finances effectively. Entrepreneurs with a higher level of financial efficacy tend to be more organized, more consistent in applying financial knowledge, and are able to make strategic decisions (Lone & Bhat, 2024). According to Martin (2025), financial efficacy has been shown to contribute positively and significantly to financial sustainability in MSMEs. Entrepreneurs with higher levels of financial efficacy tend to be skilled at preparing realistic budgets, better at cash flow monitoring, and more effective at managing their debt. Financial efficacy has been found to mediate the relationship between financial literacy and financial sustainability. This study also shows that 71.2% of financial sustainability is reflected through the combination of financial literacy, financial efficacy, and fintech adoption. Although previous studies have examined the influence of financial literacy on MSME performance and sustainability (Adegbedzi et al., 2024; Kurniasari et al., 2025). This study addresses the gap by positioning financial efficacy as a psychological pathway linking financial literacy to financial sustainability rather than treating it solely as an additional predictor. This study integrates social cognitive theory as the primary foundation to explain how financial literacy strengthens entrepreneurs financial efficacy then contributes to financial sustainability. The theory of planned behavior is used as a complementary perspective to explain how entrepreneurs financial attitudes may shape their engagement with financial learning and decision making. Rather than using the complete TPB framework, this study selectively applies its behavioral reasoning to interpret the relationship between financial attitude and financial literacy. Furthermore, the study provides contextual evidence from MSMEs in Batam, an economically strategic city with diverse business activities, and supplements the quantitative findings with interviews to provide a deeper explanation of the statistical relationships**.** Therefore, the novelty of this study lies in its psychological mechanism, theoretical integration, MSME context, and the use of interview quotations to provide contextual explanations for the quantitative findings.

2. Literature Review & Hypothesis Development

2.1 Theory of Planned Behavior

The Theory of Planned Behavior explains that behavior is influenced by attitude, subjective norms, and perceived behavioral control through behavioral intention (Ajzen, 1991). This study does not test the complete TPB framework, such as subjective norms, behavioral intention, and perceived behavioral control are not included in the research model. Instead, TPB is used as a additional theoretical perspective to explain how entrepreneurs financial attitude may encourage engagement with financial information and the development of financial literacy.

2.2 Social Cognitive Theory

Social cognitive theory by (Bandura, 2023), emphasizes that human behavior results from reciprocal interactions among personal factors, the environment, and behavior. This theory primarily focuses on self-efficacy, the extent to which a person believes in their ability to plan and carry out the actions needed to achieve results that match their expectations. This theory explains the relationships among financial literacy, financial efficacy, and financial sustainability in this research model. Financial efficacy is defined as the entrepreneur's belief in their ability to manage business finances and make rational financial decisions. In the context of social cognitive theory, high financial literacy is a personal factor that strengthens self-efficacy in the financial sector. Furthermore, strong financial performance encourages entrepreneurs to consistently implement sound financial management practices, ultimately contributing to financial sustainability. Therefore, social cognitive theory serves as the primary theoretical foundation for explaining how financial literacy strengthens financial efficacy and contributes to financial sustainability.

2.3 Hypothesis development

Financial attitude is defined as the realization of financial principles in making and evaluating financial decisions (Banthia & Dey, 2022). Entrepreneurs with a positive financial attitude are more motivated to learn, better understand financial aspects, and make more rational financial decisions. This condition encourages entrepreneurs to be more active in seeking information and understanding financial concepts, which may contribute to a higher level of financial literacy (Justyn & Marheni, 2020; Riaz et al., 2022). Meanwhile, financial attitude is also considered an important antecedent of financial literacy, as it reflects not only cognitive abilities but also the tendencies of entrepreneurs in responding and making financial decisions. Therefore, financial attitudes play a crucial role in improving financial literacy (Das & Mahapatra, 2023; Zaimovic et al., 2023). Thus, the hypothesis is formulated as follows.

H_1: Financial attitude is positively associated with financial literacy.

Financial knowledge refers to an entrepreneurs understanding of financial concepts, principles, and products that enables them to comprehend financial information and make informed financial decisions (Shah et al., 2024). Therefore, financial knowledge not only improves cognitive understanding but also the quality of financial decisions, thereby becoming a dominant factor in improving financial literacy (Banthia & Dey, 2022; Oladapo, 2024). Furthermore, financial knowledge is also seen as an antecedent of financial literacy, as it covers not only the ability to understand financial information but also the ability to apply the knowledge in making proper financial decisions, thus playing a fundamental role in developing financial literacy (Das & Mahapatra, 2023). Thus, the hypothesis is formulated as follows.

H_2: Financial knowledge is positively associated with financial literacy.

Financial behavior refers to the actions taken in various financial activities such as saving, investing, and managing expenses and debt (Banthia & Dey, 2022). Entrepreneurs with good financial behavior tend to be more involved in financial activities, therefore gaining experience in financial management. This experience can strengthen understanding of financial concepts, ultimately improving financial literacy (Oladapo, 2024). Furthermore, financial behavior is treated as an antecedents of financial literacy, reflecting not only the ability to understand financial information but also concrete actions in managing finances (Das & Mahapatra, 2023; Zaimovic et al., 2023). Thus, the hypothesis is formulated as follows.

H_3: Financial behavior is positively associated with financial literacy.

Financial literacy is the ability of an entrepreneur to understand, evaluate and apply financial knowledge when making informed decisions. According to OECD (2023), financial literacy encompasses not only knowledge and understanding of financial concepts and risks but also the skills and attitudes required to apply such knowledge effectively in financial decision making. Kurniasari et al. (2025) define financial literacy as the ability of entrepreneurs to understand various financial instruments and information. Unlike financial knowledge, which focuses on the understanding of financial concepts, financial literacy reflects the broader capability to apply that knowledge in managing business finances and making effective financial decisions. Research done by Hamid et al. (2025) shows that financial literacy influences financial efficacy, specifically subjective financial literacy, which reflects entrepreneurs' perceptions of their financial capabilities. This can be explained by the fact that entrepreneurs with higher levels of financial literacy tend to be better able to understand financial information, assess risk, and make more rational financial decisions, thereby increasing financial efficacy (Shah et al., 2024). Furthermore, a good understanding of financial concepts and management will encourage entrepreneurs to be more confident in facing financial problems (Napu et al., 2025). Thus, the hypothesis is formulated as follows.

H_4: Financial literacy is positively associated with financial efficacy.

Financial efficacy can be defined as the level of confidence an entrepreneur has in their ability to obtain information to make more effective financial decisions (Lone & Bhat, 2024). Financial efficacy plays an important role in building financial sustainability, where entrepreneurs who have high levels of self-confidence in managing and making financial decisions tend to be better at financial planning, control, and are able to evaluate MSMEs financial conditions (Awa et al., 2025;Martin, 2025). Furthermore, Veselinovic et al. (2022) stated that entrepreneurs who are confident in their financial decision-making and have the courage to make strategic decisions can generate greater profits and drive business growth. This performance can enable businesses to grow in the long term, thereby indirectly supporting financial sustainability. Thus, the following hypotheses are formulated.

H_5: Financial efficacy is positively associated with financial sustainability.

Financial sustainability is defined as the ability of MSMEs to meet current needs without sacrificing future needs (Hadiyan et al., 2025). Financial literacy plays an important role in achieving financial sustainability, with financial efficacy as a mediating role. Entrepreneurs with high levels of financial literacy tend to have a better understanding of financial concepts and the ability to evaluate risk and make more rational financial decisions, thereby increasing self-confidence in their decision-making (Shah et al., 2024 and Napu et al., 2025). Furthermore, financial efficacy supports entrepreneurs' ability to plan, control, and evaluate their MSMEs' financial condition, enhancing resilience in the face of risk and supporting financial sustainability (Awa et al., 2025; Martin, 2025). Furthermore, Pratiwi and Nurulrahmatiah (2025) found that financial literacy is associated with financial efficacy, which in turn supports MSME sustainability performance, and Khouangvichit and Samambet (2025) found that digital financial literacy supports MSME performance directly and indirectly through financial efficacy. Financial literacy not only supports financial sustainability but also, through a mediating variable, indirectly supports financial efficacy. Therefore, entrepreneurs with a higher level of financial literacy are more likely to develop confidence in planning, controlling, and making financial decisions, which ultimately supports the financial sustainability of their MSME. Thus, the following hypotheses are formulated.

H_6: Financial efficacy mediates the positive association between financial literacy and financial sustainability

Financial attitude plays a significant role in shaping entrepreneurs' financial efficacy. Research by Riaz et al. (2022) showed that a positive attitude toward money can increase entrepreneurs' confidence in their ability to control financial decisions. A healthy attitude towards money encourages entrepreneurs to be more rational in their planning and financial management, thereby making them more responsible. This sense of responsibility can encourage entrepreneurs to be more confident in managing their finances, thereby increasing financial efficacy. In line with this, financial attitudes, as psychological factors, shape how entrepreneurs view and manage finances. A positive financial attitude will encourage entrepreneurs to manage their finances, ultimately increasing financial efficacy (Adib & Intania, 2025). Furthermore, a positive financial attitude, such as being economical, rational, and disciplined, helps strengthen entrepreneurs' confidence in managing business finances (Piyani et al., 2026). Similarly, research by Rosyidah and Santoso (2024) indicated that entrepreneurs with better financial attitudes tend to have stronger confidence in managing or taking financial decisions. This finding is also supported by Amelika et al. (2026), who found that financial attitude serves as a personal factor in social cognitive theory, helping shape individual beliefs when making financial decisions and thereby increasing financial efficacy. Thus, the hypothesis is formulated as follows.

H_7: Financial attitude is positively associated with financial efficacy.

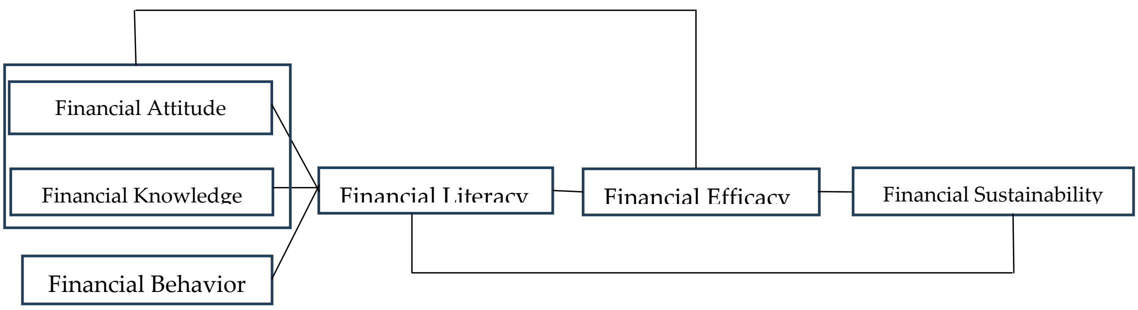
Financial knowledge plays a crucial role in shaping entrepreneurs' financial efficacy. Research by Velasco (2022) found that financial knowledge is a crucial factor in financial efficacy. By understanding financial concepts, entrepreneurs can build confidence in navigating various financial situations, which in turn encourages them to make financial decisions more rationally. Furthermore, financial knowledge also contributes to improving financial literacy (Banthia & Dey, 2022). Entrepreneurs with a more comprehensive understanding of financial concepts and information are more likely to apply that knowledge to make more rational financial decisions. A high level of financial literacy leads entrepreneurs to be more confident in making and managing more rational financial decisions (Shah et al., 2024). Furthermore, Hapsari and Widiyasti (2025) and Piyani et al. (2026) pointed out that financial knowledge can encourage entrepreneurs to feel more confident in managing and making financial decisions based on the financial understanding they possess. Thus, the hypothesis is formulated as follows.

H_8: Financial knowledge is positively associated with financial efficacy

Research by Masdupi et al. (2024) shows that financial literacy has a significant effect on financial sustainability, as understanding financial concepts enables entrepreneurs to manage risk effectively and make better financial decisions. This ability enables entrepreneurs to maintain long-term financial stability and sustainability. Furthermore, according to Martin (2025), financial literacy mediates financial inclusion with financial sustainability. This means that entrepreneurs who can effectively use digital services tend to optimize the use of financial facilities to support business growth. Furthermore, entrepreneurs with high levels of financial literacy can manage financial resources efficiently, assess risk, and make sound financial decisions to maintain business stability (Kurniasari et al., 2025). Thus, the hypothesis is formulated as follows:

H_9: Financial literacy is positively associated with financial sustainability.

Figure 1. Conceptual Framework



3. Methodology

This study uses a quantitative research method, followed by semi-structured interviews with three entrepreneurs to provide contextual explanation for the quantitative findings. The population comprised MSMEs operating in Batam for at least a year. The respondents were MSME or managers that are directly involved in managing the business operations. A non-probability purposive sampling technique was used in this study. Primary data were collected through an online questionnaire using Google Forms distributed via Facebook, MSME community groups, and approaching MSME owners directly. Responses were measured using a five-point Likert scale. A total of 379 responses were initially collected. Prior to analysis, all responses were screened to ensure respondent eligibility and response quality. Google forms was configured to restrict each google account to one submission, thereby minimizing duplicate responses. Responses were excluded if the respondents were not the owner or manager or poor response quality, including straight-lining response patterns. Consequently, 339 valid responses were retained for the final analysis. Hypothesis testing was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS. The significance of the structural relationships was assessed using complete bootstrapping with 5,000 subsamples, a two-tailed test at 5% significance level, and bias-corrected and accelerated 95% confidence intervals. A relationship was considered significant when the p-value was below 0.05 and the confidence interval did not include zero. Following the quantitative analysis, three MSME owners were purposively selected for semi-structured interviews to provide contextual explanations for the statistical findings. The informants were selected because they had been actively involved in managing their businesses for at least a year and represented different demographic characteristics and business sectors. Each interview explored the informant's experiences regarding financial knowledge, financial behavior, financial literacy, financial efficacy, and financial sustainability in managing their business. The interviews were conducted using a semi-structured interview guide, manually transcribed, and reviewed to identify statements that could enrich the interpretation of the quantitative findings. Since the interviews served only as contextual support, no formal qualitative coding or thematic analysis was performed. Consequently, the interview findings are presented as illustrative quotations rather than independent qualitative evidence.

3.1 Research Instruments

The research instrument in this study was adapted from previous studies. Financial attitude, financial knowledge, and financial behavior were measured using instruments from (Banthia and Dey (2022) with each variables having 7 indicators. Financial literacy was measured using items adapted from Kurniasari et al. (2025) with 6 indicators. While, financial efficacy was adapted from Lone and Bhat (2024) with 4 indicators. Furthermore, financial sustainability was measured using instruments adapted from Hadiyan *et al*. (2025). All variables were specified as separate first-order reflective construct. Financial attitude, financial knowledge, and financial behavior were modelled as distinct antecedents of financial literacy rather than as lower-order dimensions of a higher order financial literacy construct.

4. Results and Discussion

The sample was predominantly composed of female respondents, generation Z entrepreneurs, culinary businesses, and microenterprises with fewer than ten employees. The relatively high proportion of culinary MSMEs in this study may reflect the substantial presence of culinary businesses in Batam. According to data from the Batam Office of Cooperatives and Micro Enterprise, 1,204 culinary MSMEs were registered across the city in 2024, indicating that the sector represents a significant component of local MSME activities (Mustaqim et al., 2025). Furthermore, previous research involving MSMEs in Batam city also reported that female entrepreneurs accounted for the majority of respondents (67%). These similarities indicate that the respondent profile observed is consistent with the previous MSME research conducted in Batam City (Hati & Nainggolan, 2026). Nevertheless, the high proportion of generation Z respondents were likely associated with the use of purposive sampling and the combination of online and offline distribution, which facilitated participation from younger and more digitally active entrepreneurs. Therefore, the findings should be interpreted within the characteristics of the sampled respondents and should not be generalized to entire MSME population in Batam.

Table 1. Demographic characteristics of respondents

Construct	Item	Quantity	Percent
Gender	Male	71	21%
	Female	268	79%
Age	Generation Z	296	87%
	Generation Millennial	37	11%
	Generation X	6	2%
Last Education	Elementary school	2	1%
	Junior high school	2	1%
	Senior high school	195	58%
	Diploma	15	4%
	Bachelors/ Masters/ Doctoral	125	37%
MSMEs fields	Culinary	166	49%
	Craft	22	6%
	Trade and retail	89	26%
	Service	53	16%
	Hospitality and tourism	9	3%
Number of employees	Less than 10 employees	269	79%
	10 to 50 employees	59	17%
	more than 50 to 300 employees	11	3%

Source: Processed Data (2026)

Three MSME entrepreneurs were purposively selected to represent different age groups and business sectors. The interviews focused on their financial understanding, financial management practices, confidence in making business decisions, and experiences in maintaining business sustainability. The interview responses were summarized to provide contextual explanations for the quantitative findings. Since the interview were intended only to enrich the interpretation of the statistical results, no formal qualitative analysis or thematic coding was performed. Therefore, the interview findings are presented as illustrative quotations rather than independent qualitative evidence.

Table 2. Characteristics of interview informants

Construct	Informant 1	Informant 2	Informant 3
Gender	Male	Female	Male
Age	53 years old	45 years old	25 years old
Last education	Elementary school	Bachelors	Bachelors
MSMEs fields	Service	Culinary	Trade and retail

Source: Processed Data (2026)

Validity testing is conducted to ensure that the indicators used in the research represent the constructs being measured. The results of the validity testing are presented in the following table.

Table 3. Validity test results

Variable	Indicator	Outer Loading	AVE
Financial Attitude	FA3	0.724	0.513
	FA5	0.706	
	FA6	0.645	
	FA7	0.782	
Financial Behavior	FB1	0.748	0.616
	FB3	0.753	
	FB5	0.884	
	FB6	0.759	
	FB7	0.771	
Financial Efficacy	FE1	0.765	0.520
	FE2	0.707	
	FE3	0.657	
	FE4	0.749	
Financial Knowledge	FK1	0.716	0.517
	FK2	0.776	
	FK3	0.734	
	FK4	0.644	
Financial Literacy	FL1	0.765	0.505
	FL2	0.644	
	FL3	0.757	
	FL5	0.669	
Financial Sustainability	FS1	0.735	0.558
	FS2	0.752	
	FS3	0.742	
	FS4	0.758	

Source: Processed Data (2026)

Convergent validity was assessed based on the outer loadings and average variance extracted (AVE). The recommended outer loading were approximately 0.708 or higher, while indicators with loading between 0.40 and 0.70 should be considered for removal only when their deletion improves composite reliability or AVE without compromising content validity (Hair et al., 2022). As shown in table 4, the outer loadings ranged from 0.644 to 0.884. although several indicators exhibited loadings below 0.708, they were retained to preserve the theoretical and conceptual coverage of their constructs. All constructs achieved AVE values above the recommended threshold of 0.50, indicating that each construct explained more than half of the variance in its indicators.

Table 4. Deleted Indicators and reasons for deletion

Deleted Indicator	Original Item	Outer loading	Reason for deletion
FA1	I always stay informed about financial planning	0.545	Insufficient outer loading

FA2	I have the knowledge of personal financial awareness.	0.366	Insufficient outer loading
FA4	I stay informed about different investment avenues.	0.642	Marginal outer loading and limited contribution to convergent validity
FB2	I spend money than to save it for the long term	0.122	Insufficient outer loading
FB4	My financial condition restricts me to do some important things in my life.	0.479	Insufficient outer loading
FK5	I know that high inflation leads to increase the cost of living	0.524	Insufficient outer loading
FK6	I know that the value of money changes with time.	0.356	Insufficient outer loading
FK7	I am quite confident of using various electronic transactions	0.530	Insufficient outer loading
FL4	I use my financial knowledge to increase my business performance.	0.628	Marginal outer loading and limited contribution to convergent validity
FL6	I am willing to invest in attending financial workshops for SMEs	0.637	Marginal outer loading and limited contribution to convergent validity
FS5	I always track my business costs and profit	0.617	Marginal outer loading and limited contribution to convergent validity

Source: Processed Data (2026)

The measurement model was reassessed by considering both statistical criteria and the conceptual coverage of each construct. Indicators were removed when their low outer loading affected convergent validity, while ensuring that the retained indicators continued to represent the conceptual domain of the respective constructs.

Table 5. Discriminant validity (*Fornell-Larcker)*

	Financial Knowledge	**Financial Attitude**	**Financial Behavior**	**Financial Efficacy**	**Financial Literacy**	**Financial Sustainability**
Financial Knowledge	0.719					

Financial Attitude	0.666	0.716				
Financial Behavior	0.240	0.221	0.785			
Financial Efficacy	0.577	0.523	0.124	0.721		
Financial Literacy	0.540	0.552	0.214	0.514	0.711	
Financial Sustainability	0.576	0.529	0.132	0.711	0.576	0.747

Table 6. Discriminant validity (HTMT)

	Financial Knowledge	Financial Attitude	Financial Behavior	Financial Efficacy	Financial Literacy	Financial Sustainability
Financial Knowledge						
Financial Attitude	0.972					
Financial Behavior	0.297	0.264				
Financial Efficacy	0.839	0.759	0.172			
Financial Literacy	0.772	0.807	0.263	0.736		
Financial Sustainability	0.805	0.747	0.180	0.996	0.796	

Source: Processed Data (2026)

Table 7. HTMT Bias-Corrected 95% Bootstrap confidence interval

	2.5%	97.5%
Financial Attitude -> Financial Knowledge	0.840	1.086
Financial Behavior -> Financial Knowledge	0.181	0.426
Financial Behavior -> Financial Attitude	0.157	0.379
Financial Efficacy -> Financial Knowledge	0.649	1.050
Financial Efficacy -> Financial Attitude	0.563	0.953
Financial Efficacy -> Financial Behavior	0.091	0.263
Financial Literacy -> Financial Knowledge	0.547	0.955
Financial Literacy -> Financial Attitude	0.622	0.948
Financial Literacy -> Financial Behavior	0.146	0.403
Financial Literacy -> Financial Efficacy	0.498	0.969
Financial Sustainability -> Financial Knowledge	0.625	0.981
Financial Sustainability -> Financial Attitude	0.574	0.898
Financial Sustainability -> Financial Behavior	0.102	0.247
Financial Sustainability -> Financial Efficacy	0.865	1.113

Financial Sustainability -> Financial Literacy	0.603	0.950

Source: Processed Data (2026)

Table 8. Indicators Cross-loading

Indicator	Financial Knowledge	Financial Attitude	Financial Behavior	Financial Efficacy	Financial Literacy	Financial Sustainability
FA3	0.456	0.724	0.165	0.332	0.393	0.316
FA5	0.484	0.706	0.132	0.352	0.372	0.424
FA6	0.407	0.645	0.157	0.376	0.430	0.343
FA7	0.555	0.782	0.177	0.428	0.381	0.426
FB1	0.239	0.206	0.748	0.137	0.189	0.164
FB3	0.068	0.009	0.753	0.044	0.076	-0.047
FB5	0.192	0.205	0.884	0.118	0.226	0.110
FB6	0.255	0.190	0.759	0.128	0.142	0.159
FB7	0.122	0.165	0.771	0.009	0.131	0.039
FE1	0.407	0.435	0.124	0.765	0.420	0.529
FE2	0.384	0.373	0.057	0.707	0.352	0.495
FE3	0.480	0.372	0.122	0.657	0.310	0.469
FE4	0.395	0.327	0.053	0.749	0.395	0.554
FK1	0.716	0.440	0.237	0.416	0.290	0.327
FK2	0.776	0.465	0.179	0.462	0.404	0.476
FK3	0.734	0.555	0.143	0.415	0.389	0.468
FK4	0.644	0.450	0.139	0.361	0.455	0.368
FL1	0.441	0.397	0.165	0.393	0.765	0.498
FL2	0.372	0.368	0.182	0.327	0.644	0.379
FL3	0.416	0.444	0.110	0.440	0.757	0.450
FL5	0.278	0.352	0.165	0.272	0.669	0.268
FS1	0.502	0.439	0.176	0.499	0.455	0.735
FS2	0.404	0.380	0.105	0.544	0.450	0.752
FS3	0.414	0.415	0.034	0.550	0.385	0.742
FS4	0.402	0.346	0.080	0.529	0.431	0.758

Source: Processed Data (2026)

Discriminant validity was assessed using the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT). The Fornell Larcker criterion compares the square root of the average variance extracted of each construct with its correlation with other construct. The result indicated that the square root of the AVE for each construct was greater than its corresponding inter-construct correlations, providing initial support for discriminant validity. Most constructs pairs exhibited HTMT values below the recommended threshold of 0.90. However, the HTMT values between financial attitude and financial knowledge and between financial efficacy and financial sustainability exceeded the threshold, indicating potential discriminant validity concerns, additional assessments using cross-loadings and bootstrapped HTMT confidence intervals were conducted to further examine the empirical distinctiveness of the constructs. The bias corrected 95% bootstrap confidence intervals further showed that the intervals for financial attitude-financial knowledge, financial efficacy-financial knowledge, and financial efficacy-financial sustainability included 1.00. therefore, although most construct pairs supported discriminant validity, discriminant validity could not be conclusively established for these three pairs. These remaining concerns were acknowledged and further evaluated using the cross-loading results. The cross-loading assessment further showed that each indicator loaded more strongly on its assigned construct than on the other constructs, providing additional evidence of indicator level discriminant validity.

Table 9. Reliability test results

Variable	Cronbach's Alpha	rho_A	Composite Reliability
Financial Attitude	0.681	0.681	0.807
Financial Behavior	0.848	0.891	0.889
Financial Efficacy	0.690	0.693	0.812
Financial Knowledge	0.686	0.689	0.810
Financial Literacy	0.675	0.686	0.802
Financial Sustainability	0.736	0.736	0.835

Source: Processed Data (2026)

Construct reliability was assessed using Cronbach's alpha, rho_A and composite reliability. The results indicate that all constructs achieved satisfactory composite reliability, while some Cronbach alpha and rho_A values were slightly below the conventional threshold of 0.70. given that composite reliability accounts for the different outer loadings of the indicators and all CR values exceeded the recommended threshold, the constructs demonstrated acceptable internal consistency reliability. Nevertheless, the lower Cronbach's alpha and rho_A values are reported transparently and interpreted alongside the other reliability measures rather than relying on a single criterion (Hair et al., 2022).

Table 10. Inner VIF

	Financial Efficacy	Financial Literacy	Financial Sustainability
Financial Knowledge	1.946	1.826	
Financial Attitude	1.983	1.809	
Financial Behavior		1.069	
Financial Efficacy			1.359
Financial Literacy	1.558		1.359

Source: Processed Data (2026)

Before evaluating the structural relationships, collinearity among the predictor constructs were assessed using inner VIF values. According to Hair et al (2022), VIF values of 5 or above may indicate collinearity problems, while values below 3 are considered a more conservative criterion. The inner VIF values in this study were below the recommended threshold, indicating that collinearity among the predictor constructs was not at a critical level.

Table 11. Direct effect test results

Hypothesis	Original Sample	Sample Mean	T Statistics	P Values	Bca 95% Cl	Result
Financial Knowledge -> Financial Efficacy	0.336	0.338	5.987	0.000	(0.223, 0.441)	Significant
Financial Knowledge -> Financial Literacy	0.298	0.299	3.337	0.001	(0.111, 0.467)	Significant

Financial Attitude -> Financial Efficacy	0.166	0.165	2.846	0.004	(0.055, 0.280)	Significant
Financial Attitude -> Financial Literacy	0.339	0.336	4.311	0.000	(0.187, 0.493)	Significant
Financial Behavior -> Financial Literacy	0.067	0.080	1.724	0.085	(-0.020, 0.131)	Not Significant
Financial Efficacy -> Financial Sustainability	0.563	0.558	6.549	0.000	(0.376, 0.708)	Significant
Financial Literacy -> Financial Efficacy	0.241	0.244	3.759	0.000	(0.116, 0.367)	Significant
Financial Literacy -> Financial Sustainability	0.287	0.291	3.388	0.001	(0.127, 0.456)	Significant

Source: Processed Data (2026)

Table 12. Indirect effect test result

Hypothesis	**Original Sample**	**Sample Mean**	**T Statistics**	**P Values**	**Bca 95% Cl**	**Results**
Financial Literacy -> Financial Efficacy -> Financial Sustainability	0.136	0.134	3.594	0.000	(0.073, 0.223)	Complementary mediation

Source: Processed Data (2026)

Hypothesis 1

Based on the test results, financial attitude was positively and significantly associated with financial literacy. This finding indicates that entrepreneurs with more responsible financial attitudes tend to demonstrate a better understanding of financial management. This finding it is consistent with Justyn and Marheni (2020) and Riaz et al. (2022), who found out that attitudes toward saving, financial planning, and cash flow recording are associated with higher levels of financial literacy. Therefore, financial attitude can be viewed as an important antecedent of financial literacy rather than a component of the construct itself. (Das & Mahapatra, 2023).

To provide additional context for the quantitative findings, the interviews responses illustrated how the informants applied responsible financial attitudes in managing their business. All three informants stated that they ensured their monthly expenses did not exceed their income. Furthermore, informants 1 and 2 preferred relatively low risk investments, such as deposits, whereas informant 3 was more willing to invest in higher risk instruments, such as stocks. Although their risk preferences differed, all informants demonstrated careful consideration of financial consequences before making financial decisions. These responses illustrate that responsible financial attitude may be reflected through prudent financial decision making rather than identical investment preferences.

These findings are consistent with the behavioral reasoning of the theory of planned behaviors, suggesting that entrepreneurs with a positive financial attitude are more likely to engage in financial learning and develop higher financial literacy. Entrepreneurs who believe that careful financial management benefits their business are more likely to develop the knowledge required to make appropriate financial decisions. Thus, financial attitude may contribute to financial literacy by encouraging active learning and greater attention to financial management.

Hypothesis 2

Financial knowledge was positively and significantly associated with financial literacy. This indicates that entrepreneurs who possess a stronger understanding of financial concepts tend to be better equipped to manage their finances and make informed decisions. This finding aligns with research by Banthia and Dey (2022) and Oladapo (2024), who found that financial knowledge provides an important foundation for understanding financial information and making appropriate financial decisions. Therefore, financial knowledge should be viewed as an antecedent of financial literacy rather than as a component of the construct itself (Das & Mahapatra, 2023).

To provide additional context for the quantitative findings, the interview responses illustrated how financial knowledge was applied in business decision making. All three informants demonstrated and understanding of financial concepts such as risk and return, inflation, and interest rates. For example, informant 2 stated "I understand that inflation can weaken the value of money over time, therefore, idle funds are invested in instruments that can keep up with the rate of inflation." This example illustrates how financial knowledge can be translated into practical financial decisions when evaluating economic conditions and selecting appropriate investment instruments.

Theoretically, financial knowledge represents a cognitive capabilities that supports the beliefs and consideration underlying entrepreneurs financial decisions. Although knowledge is not a central construct of the Theory of Planned Behavior, it can provide the informational basis through which entrepreneurs can evaluate financial choices and develop their financial capabilities. This finding suggest that financial literacy depends not only on access to financial information but also the ability to understand and apply that information.

Hypothesis 3

Financial behavior was not significantly associated with financial literacy. This finding suggest that financial practices among entrepreneurs in Batam are not always accompanied by a strong understanding of financial concepts. Some entrepreneurs may record cash flow, pay bills on time, or monitor expenses as part of business routines, administrative requirement, or established habits rather than as the result of good financial understanding. Therefore financial behavior may be practical and habit based, whereas financial literacy requires the ability to understand, evaluate, and apply financial concepts.

This finding is consistent with Nusa et al. (2021), Wutun et al. (2023), and Trixsiana and Lestari, (2024), who reported that the relationship between financial literacy and financial behavior is not always statistically significant. Furthermore, Rachma and Wahyuni, (2023) noted that observable financial practices do not necessarily represent a high level of financial literacy because individuals may perform financial activities without fully understanding the concepts underlying those activities.

The interview findings provide further insight into this non-significant relationship. Informant 1 indicated that entrepreneurs may have a good understanding of finance but do not always apply it consistently in their business activities. Meanwhile, informant 3 demonstrated financial practices such as recording cash flow, although these records were not maintained in a detailed or systematic manner. These contrasting findings indicated a possible gap between financial understanding and its practical application. Entrepreneurs may understand financial concepts without consistently implementing them, while other may perform basic financial activities without possessing comprehensive financial knowledge. Consequently, financial behavior should not automatically be treated as an indicator of financial literacy.

Although the complete TPB framework was not examined in this study, TPB provides a useful perspective for understanding why observable financial behavior may also be influenced by factors beyond financial understanding, such as social expectations or perceived control. Entrepreneurs may adopt a certain practices because they are encouraged by family members, business partners, lenders, or administrative requirements, or because the practices have become habitual. Therefore, observable financial behavior may occur even when the entrepreneurs underlying financial understanding remain limited.

It is also possible that financial behavior operates as an outcome of financial literacy rather than its antecedent, as entrepreneurs may adopt more systematic financial practices after developing sufficient financial understanding.

To further examine this alternative direction, an alternative structural model was made by reversing the relationship between financial behavior and financial literacy while retaining the remaining structural relationship. This alternative specification was also supported by previous studies that designed financial literacy as an antecedent of financial behavior (Sholikhah & Purwanto, 2024). The result showed that financial literacy had a positive and significant effect on financial behavior, with a path coefficient of 0.214, a t-statistic of 4.154, and a p-value of below 0.001. the bootstrap confidence interval ranged from 0.108 to 0.297, further supporting the significance of this relationship. However, the alternative model explained only 4.6% of the variance in financial behavior, indicating limited explanatory power. Nevertheless, the original direction from financial behavior to financial literacy was retained and supported by previous empirical evidence, including (Shroff et al., 2025).

Hypothesis 4

Financial literacy was found to have a significant positive relationship with financial efficacy. This finding indicates that entrepreneurs with higher levels of financial literacy tend to report greater confidence in their ability to evaluated financial information, manage business finance, and make financial decisions. These findings align with the research by Shah et al. (2024); Hamid et al. (2025); Napu et al. (2025), who found that a stronger understanding of financial concepts ad market conditions is associated with greater confidence in financial decision making.

To provide additional context for the quantitative findings, the interviews responses illustrated how financial literacy contributed to entrepreneurs confidence in managing financial decisions. For example, informant 2 explained that understanding the impact of inflation encouraged investment in financial instruments that could preserve the value of money. Similarly, informant 3 described how applying financial knowledge through investment activities and financial management increased confidence in making financial decisions. These examples illustrate how financial literacy, when combined with practical experience, may strengthen entrepreneurs confidence in handling financial challenges and evaluating appropriate financial alternatives.

From the perspective of Social Cognitive Theory, financial literacy can be viewed as a cognitive resource that supports the development of financial efficacy. Knowledge of financial concepts enables entrepreneurs to interpret financial information and assess the possible consequences of their decisions, while experience in applying that knowledge may reinforce their confidence. Therefore, the finding suggest that financial literacy and practical financial experience are associated with stronger financial efficacy. However, the relationship should not be interpreted as evidence that financial literacy directly causes an increase in financial efficacy.

Hypothesis 5

Financial efficacy was found to have a significant positive relationship with financial sustainability. This indicates that entrepreneurs with greater confidence in managing finances and making financial decisions tend to report stronger financial sustainability. Financial efficacy can be understood as a psychological resource that supports entrepreneurs in evaluating financial alternatives, responding to uncertainty, and maintaining consistent financial management practices (Veselinovic et al., 2022; Awa et al., 2025; Martin, 2025).

Interview responses illustrated how financial efficacy was reflected in the entrepreneurs financial management practices. For example, informant 3 stated that “regarding paying bills, it goes smoothly without any obstacle because, in my opinions, it is an obligation that must be fulfilled.” This example illustrates how confidence in managing financial responsibilities may contribute to maintaining financial discipline and business stability. Therefore, financial efficacy may be associated with financial sustainability through entrepreneurs ability to maintain financial discipline, respond to business challenges, and continue making financial decisions under difficult conditions.

From the perspective of Social Cognitive Theory, individuals with stronger self-efficacy are more likely to persist when facing obstacles, invest greater effort in achieving their goals, and remain committed to their decisions. Applied to the MSME context, entrepreneurs who believe in their ability to manage financial challenges may be more willing to take corrective action, adjust financial plans, and maintain business operation during periods of uncertainty. Thus, this finding extends the application of Social Cognitive Theor by showing that financial efficacy is not merely a personal belief but is also associated with the resilience and continuity of the business. However, this relationship should not be interpreted as evidence that financial efficacy directly causes financial sustainability.

Hypothesis 6

Based on the test results, a significant indirect relationship between financial literacy and financial sustainability was identified through financial efficacy. This finding suggest that entrepreneurs ability to understand, analyse, and manage financial conditions is associated with greater confidence in making financial decisions, which is subsequently related to stronger financial sustainability. This aligns with Napu et al. (2025), who found that financial literacy is associated with entrepreneurs ability to understand and manage financial conditions effectively, as well as with greater confidence in financial decision making. In addition, Martin, (2025) found that financial efficacy plays an important role in linking entrepreneurs financial capabilities with MSME financial sustainability. This finding is also consistent with Khouangvichit and Samambet (2025) and Pratiwi and Nurulrahmatiah (2025), who reported significant direct and indirect relationships between financial literacy and financial sustainability.

The interview findings provide further insight into this indirect relationship. The informants indicated their financial understanding was associated with greater confidence in managing finances and making business decisions. This confidence, in turn, helped them apply financial strategies, respond to financial challenges, and maintain business operations more consistently. Although the informants differed in their financial management methods and business experiences, a common pattern emerged in which financial understanding and confidence complemented each other in supporting business sustainability.

From Social Cognitive Theory, financial literacy represents a cognitive resource, whereas financial efficacy reflects entrepreneurs belief in their ability to apply that resource. The findings therefore provide a more detailed explanation of the mechanism linking financial literacy with financial sustainability. Financial understanding alone may not be sufficient unless entrepreneurs also possess the confidence to translate that understanding into financial planning, control, and strategic decision making. Thus, financial efficacy represents a psychological pathway through financial literacy is indirectly associated with MSME financial sustainability. However, the mediation result should be interpreted as statistical evidence rather than a proof of causal temporal mechanism.

Furthermore, since both the direct effect of financial literacy on financial sustainability and the indirect effect through financial efficacy were positive and statistically significant, the mediating role of financial efficacy can be classified as complementary mediation (Hair et al., 2022).

Hypothesis 7

Financial attitude was positively and significantly associated with financial efficacy. This indicates that entrepreneurs with a positive attitude towards finance tend to report greater confidence in managing business finances and making financial decisions. These findings align with research by (Riaz et al., 2022; Rosyidah & Santoso, 2024;Adib & Intania, 2025; Piyani et al., 2026). Who identified a positive relationship between responsible financial attitude and confidence in financial management. Financial attitude reflects how entrepreneurs evaluate and approach financial planning, expenditure control, and the use of financial resources. Entrepreneurs who prioritize planning, control their expenses, and maintain an orientation toward responsible financial management may be better prepared to respond to different financial situations. Similarly, Amelika et al. (2026) found that entrepreneurs with a positive financial attitude tend to demonstrate stronger confidence when dealing with financial challenges.

The interview results also support this finding, with informant 1 confirming that monthly expenses do not exceed their income and expressing confidence in their money management abilities, as reflected in the continuity of the business. This indicates that a responsible financial attitude may be associated with a stronger sense of control over business finances and greater confidence when evaluating financial alternatives.

From the perspective of Social Cognitive Theory, financial attitude can be understood as a personal factor associated with the development of financial efficacy. Entrepreneurs who view financial planning and control positively may be more willing to engage with financial challenges and believe that they are capable of managing them. Thus, the findings suggest that financial attitude and financial efficacy are closely related, as a responsible orientation toward financial management may support entrepreneurs confidence in handling business finances.

Hypothesis 8

Financial knowledge was positively and significantly associated with financial efficacy. This finding indicates that entrepreneurs who understand various financial concepts, such as inflation, risk, and financial management, tend to report greater confidence in evaluating financial alternatives and making financial decisions. A stronger understanding of these concepts may help entrepreneurs interpret financial conditions more accurately and feel better prepared when dealing with financial uncertainty. This finding aligns with Velasco (2022) research, which states that financial knowledge is an initial factor in developing entrepreneurs' financial efficacy; entrepreneurs with higher levels of knowledge tend to have greater confidence in managing and making financial decisions, which supports this finding (Shah et al., 2024). Hapsari and Widiyasti (2025) similarly found that higher financial knowledge was associated with stronger financial efficacy indicating that entrepreneurs with better financial understanding tend to have greater confidence in their ability to manage financial decisions. Similarly, Piyani et al. (2026) noted that financial knowledge not only provides entrepreneurs with information about financial concepts but also strengthens their confidence in applying that knowledge to financial decision making.

Interview results also support this finding: informant 3, with banking experience, demonstrated an understanding of financial concepts such as risk, return, and investment instruments. The informant indicated that this knowledge was associated with greater confidence in managing finances and selecting appropriate financial alternatives. This suggest that knowledge gained through education or professional experience may provide entrepreneurs with a stronger basis for assessing financial situations and believing in their ability to respond appropriately.

From the perspective of Social Cognitive Theory, financial knowledge can be understood as a cognitive resource associated with the development of financial efficacy. Knowledge enables entrepreneurs to interpret financial information, evaluate possible outcomes, and assess the consequences of different decisions. When entrepreneurs believe that they possess sufficient knowledge to address financial challenges, they may also report stronger confidence in their financial capabilities. Thus, this finding suggest that financial knowledge and financial efficacy are closely related.

Hypothesis 9

Financial literacy was positively and significantly associated with financial sustainability. This indicates that entrepreneurs who understand finance thoroughly tend to report greater financial stability and business resilience. Financial literate entrepreneurs may be better equipped to interpret financial information, control expenses, manage cash flow, evaluate risks, and select appropriate financial alternatives. This finding aligns with research by Masdupi et al. (2024); Kurniasari et al. (2025); Martin (2025), who found that financial literacy is positively related to the financial sustainability of MSMEs through more informed financial management and decision making.

Interview results also support these findings, as all informants demonstrated an understanding of financial concepts, including controlling expenses, understanding inflation, and managing cash flow and investments. With this understanding, informants can make more rational financial decisions and manage risk, thereby maintaining the business's financial stability and encouraging financial sustainability. Therefore, financial literacy may be associated with financial sustainability by providing entrepreneurs with the cognitive resources needed to respond to changing business conditions and maintain financial stability. This direct relationship complements the mediation finding by indicating that financial literacy is associated with financial sustainability both directly and indirectly. Financial understanding may support financial sustainability by improving the quality of financial evaluation and management, while financial efficacy reflects entrepreneurs confidence in applying that understanding.

This finding is supported by social cognitive theory, financial literacy can be viewed as a cognitive resource that interacts with personal beliefs and financial decision making. Entrepreneurs who understand financial conditions may be better prepared to adapt their financial strategies and respond to business challenges.

Table 13. Total Effects

	Original Sample	T Statistics	P Values	Bca 95% Cl
Financial Knowledge -> Financial Efficacy	0.408	6.046	0.000	(0.272,0.535)
Financial Knowledge -> Financial Literacy	0.298	3.413	0.001	(0.118, 0.464)
Financial Knowledge -> Financial Sustainability	0.315	5.530	0.000	(0.204, 0.427)
Financial Attitude -> Financial Efficacy	0.248	4.005	0.000	(0.128, 0.372)
Financial Attitude -> Financial Literacy	0.339	4.457	0.000	(0.185, 0.488)
Financial Attitude -> Financial Sustainability	0.237	4.434	0.000	(0.138, 0.348)
Financial Behavior -> Financial Efficacy	0.016	1.432	0.152	(-0.000, 0.040)
Financial Behavior -> Financial Literacy	0.067	1.701	0.089	(-0.007, 0.132)
Financial Behavior -> Financial Sustainability	0.028	1.628	0.104	(-0.002, 0.060)
Financial Efficacy -> Financial Sustainability	0.563	6.589	0.000	(0.373, 0.711)
Financial Literacy -> Financial Efficacy	0.241	3.801	0.000	(0.112, 0.364)
Financial Literacy -> Financial Sustainability	0.423	5.294	0.000	(0.255, 0.570)

Source: Processed Data (2026)

Table 13 presents the total effects of the structural relationships, incorporating both direct and indirect effects where applicable. The results indicate that most total effects were positive and statistically significant, whereas the total effects involving financial behavior were not statistically significant, as their confidence intervals included zero.

Table 14. *R-square* testing result

Variable	r^2	Adjusted r^2	Result
Financial Efficacy	0.404	0.399	Weak
Financial Literacy	0.363	0.357	Weak
Financial Sustainability	0.566	0.563	Moderate

Source: Processed Data (2026)

The adjusted R^2 results indicated that the predictors included in the model explained approximately 39.9% of the variance in financial efficacy, 35.7% for financial literacy, and 56.3% for financial sustainability. Among the constructs, financial sustainability exhibited the highest proportion of explained variance. Overall, the result demonstrate varying levels of explanatory powers across the endogenous constructs (Hair et al., 2022).

Table 15. Effect analysis test results

Hypothesis	f^2	Result

Financial Knowledge -> Financial Efficacy	0.097	Small
Financial Knowledge -> Financial Literacy	0.076	Small
Financial Attitude -> Financial Efficacy	0.023	Small
Financial Attitude -> Financial Literacy	0.100	Small
Financial Behavior -> Financial Literacy	0.007	No effect
Financial Efficacy -> Financial Sustainability	0.537	Large
Financial Literacy -> Financial Efficacy	0.063	Small
Financial Literacy -> Financial Sustainability	0.139	Small

Source: Processed Data (2026)

The effect-size analysis indicates that the predictors differed in their substantive contribution to the endogenous constructs. While several relationships demonstrated meaningful contributions to the model explanatory power, the contribution of financial behavior to financial literacy was negligible, consistent with the weak structural relationship observed between these constructs. Overall, the results suggest that statistical significance should be considered alongside the substantive magnitude of each relationship when evaluating the structural model (Hair et al., 2022).

Table 16. Q-square

Variable	**Q^2**	**Hasil**
Financial Efficacy	0.200	Moderate
Financial Literacy	0.167	Moderate
Financial Sustainability	0.33007	Moderate

Source: Processed Data (2026)

The Q^2 results indicate that the model demonstrates predictive relevance for all endogenous constructs, as all Q^2 values are greater than zero. The magnitude of the Q^2 values further indicates moderate predictive relevance across the endogenous constructs (Hair et al., 2022). These findings provide initial evidence of the model's predictive relevance, which is further assessed using PLS predict.

Table 17. PLS Predict

Indicator	**PLS RMSE**	**LM RMSE**	**Q^2_predict**	**Result**
FE3	0.927	0.950	0.218	PLS<LM
FE2	0.730	0.730	0.158	Equal
FE4	0.697	0.718	0.148	PLS<LM
FE1	0.665	0.677	0.195	PLS<LM
FL5	0.719	0.724	0.103	PLS<LM
FL2	0.668	0.688	0.156	PLS<LM
FL3	0.681	0.681	0.202	Equal
FL1	0.636	0.645	0.194	PLS<LM
FS4	0.817	0.842	0.161	PLS<LM
FS2	0.802	0.823	0.173	PLS<LM
FS3	0.854	0.864	0.188	PLS<LM
FS1	0.827	0.808	0.246	PLS>LM

Source: Processed Data (2026)

The PLS predict assessment provides further evidence of the model's predictive performance. All indicators exhibited positive Q^2 predict values, indicating that the PLS-SEM predictions outperformed the naïve benchmark. However, comparison of the prediction errors with the linear model benchmark revealed mixed performance across the indicators. While PLS-SEM produced lower prediction errors for several indicators, the LM benchmark performed better for other. Accordingly, the model demonstrates the predictive relevance, although its predictive power is not uniformly strong across all indicators (Hair et al., 2022).

Table 18. SRMR

Model	Original Sample	Result
Saturated Model	0.074	Acceptable
Estimated Model	0.076	Acceptable

Source: Processed Data (2026)

The SRMR assessment indicated an acceptable model fit, as the obtained values were below the recommended threshold of 0.08. this suggest that the variance between the observed and model-implied correlation matrices was within an acceptable range (Hair et al., 2022).

4.1 Practical Implication

Government agencies, financial institutions, and MSME support organizations should complement general financial education with practical assistance, including financial coaching, mentoring, bookkeeping support, cash-flow planning workshops, peer learning, and decision simulations. Because routine financial behavior does not necessarily reflect financial understanding, these program should explain the reasoning behind budgeting, debt management, and risk evaluation. They should also provide opportunities for entrepreneurs to practice financial decisions and receive feedback, thereby strengthening their confidence in applying financial knowledge to MSME sustainability.

5. Conclusion and Suggestions

This study indicate that financial attitude and financial knowledge positively associated with financial literacy, while financial behavior does not. Financial literacy significantly affects both financial efficacy and financial sustainability, and financial efficacy mediates the relationship between the two. This research underscores the importance of improving financial literacy programs and strengthening financial efficacy to further enhance financial sustainability.

6. Limitation and Future Research

This study has several limitations. The moderate R-square value indicates that other factors associated with financial sustainability but were not included in the research model. Furthermore, the use of non-probability sampling and respondents from Batam city limits the generalizability of the study's results. Future research is recommended to include additional variables, such as fintech adoption and access to financing, and to expand the scope of the research area.

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