MIKAILALSYS
Journal of Multidisciplinary Sciences

e-ISSN : 2987-2286
p-ISSN : 2987-3924

Index: Harvard, Boston, Sydney, Copernicus, Sinta 4, Scilit, Semantic, Google, etc

https://doi.org/10.58578/mikailalsys.v4i3.11970

The Influence of Digital Financial Literacy and Financial Technology Use on MSME Financial Performance with Financial Inclusion as a Mediating Variable among MSMEs in Sidoarjo

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Article Info:

Submitted:	Revised:	Accepted:	Published:
Jul 18, 2026	Aug 15, 2026	Aug 27, 2026	Sep 1, 2026

Abstract

The expansion of digital finance creates opportunities for micro, small, and medium enterprises (MSMEs) to improve their financial performance while simultaneously requiring adequate digital financial capabilities and access to appropriate financial services. This study examines the effects of digital financial literacy and financial technology use on MSME financial performance, with financial inclusion as a mediating variable, in Sidoarjo Regency. A quantitative approach with an explanatory research design was employed. The study involved 116 MSME respondents selected through purposive sampling. Data were collected using a five-point Likert-scale questionnaire and analyzed through path analysis and the Sobel test to assess direct and indirect effects. The findings support the examination of digital financial literacy, financial technology use, financial inclusion, and financial performance as an integrated framework for understanding MSME digitalization. The study concludes that strengthening digital financial capabilities and expanding access to financial services are important for supporting MSME financial performance. By integrating

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technological capability, financial access, and business outcomes within a single analytical framework, this study contributes to understanding the role of financial inclusion in MSME digitalization. The findings underscore the need for MSME owners and policymakers to coordinate financial literacy development, financial technology adoption, and financial inclusion initiatives.

Keywords: Digital Financial Literacy; Financial Inclusion; Financial Performance; Financial Technology; Micro, Small, and Medium Enterprises

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a significant role in the Indonesian economy by contributing to economic activity and supporting the livelihoods of communities. At the same time, MSMEs operate in an increasingly digitalized business environment, requiring business owners not only to manage their operational activities but also to adapt to changes in financial management, payment systems, financing mechanisms, and access to financial services. These conditions make financial management capability an important aspect of maintaining business performance. Within an increasingly technology-driven economy, the ability of MSMEs to utilize digital resources has become increasingly relevant because technology can improve transaction efficiency, expand market access, and support business management processes. Affandi et al. (2024) demonstrated that digital adoption is associated with business performance and financial literacy among ultra-micro, micro, and small enterprises in Indonesia. This development indicates that digital transformation cannot be separated from the ability of MSME owners to manage financial resources effectively.

Digitalization has also transformed the way MSME owners conduct transactions and manage financial activities. The use of digital payments, mobile banking, and various technology-based financial services provides more practical alternatives to conventional mechanisms. Ananda and Biduri (2025) demonstrated that MSME digitalization and the use of payment gateways are associated with MSME performance. At the same time, the utilization of financial services based on technology can facilitate broader access to financial services. Atarwaman et al. (2023) found that financial technology affects financial inclusion among MSMEs. Therefore, financial technology functions not only as a payment instrument but also as a potential means of connecting MSME owners with a broader financial

ecosystem. However, the availability of technology does not necessarily generate optimal benefits when business owners lack the ability to understand and utilize it appropriately.

This capability is closely related to digital financial literacy. Digital financial literacy has become increasingly important because financial decisions made by business owners now take place within an environment involving digitally based financial products, services, and risks. Choung et al. (2023) demonstrated that digital financial literacy is associated with financial well-being, highlighting the importance of understanding financial services within a digital environment. For MSMEs, such capability is necessary to understand the characteristics of digital financial products, assess their benefits and risks, and select services that correspond to business needs. Ratnawati et al. (2025) further demonstrated that improvements in digital financial literacy are associated with firm performance in the context of digitalization in Indonesia. This suggests that digital financial literacy is not merely a technical ability to operate digital applications but can serve as a foundation for MSME owners to make more appropriate financial decisions.

MSME financial performance essentially reflects the ability of a business to generate economic outcomes through the effective management of its available resources. Such performance can be reflected in sales growth, profitability, customer growth, operational efficiency, and business continuity. Fitrianita and Sinarwati (2024) found that financial literacy and financial technology have a positive and significant effect on the financial performance of MSMEs in Karangasem Regency. This finding indicates that financial capabilities and technological utilization can contribute to improved business outcomes. Nevertheless, the relationship is not consistently supported across previous studies. Hayati et al. (2026) found that digital payment did not significantly affect the financial performance of Warung Madura in Candi District, Sidoarjo, although financial literacy had a significant effect. These differences indicate that the utilization of financial technology does not automatically improve financial performance and may depend on the conditions and capabilities of business owners in optimizing technology.

This issue is particularly important in Sidoarjo Regency. Based on the data presented in the thesis, the number of registered MSMEs in Sidoarjo Regency reached 153,288 units in July 2026. The growth in the number of MSMEs has occurred alongside efforts to strengthen business capacity through digital transaction systems, improved financing access, and MSME empowerment programs. At the local level, Putri et al. (2025) demonstrated that financial

literacy, financial inclusion, and financial technology simultaneously affect MSME sustainability in Tarik District, Sidoarjo. Nevertheless, the large number of MSMEs and the increasingly widespread use of technology do not directly demonstrate whether MSME owners possess sufficient digital financial literacy and financial technology capabilities to generate stronger financial performance.

This condition is further supported by inconsistent findings regarding the relationship between financial technology and business outcomes. Khoiroh and Anwar (2025) found that financial technology and e-commerce did not significantly affect MSME income in Sidoarjo Regency. In contrast, Rizky (2025) found that financial technology literacy had a positive and significant effect on MSME income in Candi District, Sidoarjo. These divergent findings indicate an empirical issue concerning how financial technology generates benefits for MSMEs. Hazmi et al. (2025) found that financial technology, financial literacy, and financial inclusion affect improvements in business performance. Such differences suggest that the effect of technology on MSME performance cannot be adequately understood through direct relationships alone but should also consider the ability of business owners to understand, access, and utilize financial services.

In addition to financial literacy and technology, financial inclusion represents an important dimension because it concerns the ability of MSME owners to obtain and utilize financial services according to their business needs. Martono and Febriyanti (2023) demonstrated that financial literacy affects financial inclusion among MSMEs. This relationship indicates that financial knowledge and capability can provide a foundation for business owners to access financial services. In the context of Sidoarjo, Septiani and Wuryani (2020) found a relationship between financial literacy, financial inclusion, and MSME performance. Therefore, financial inclusion is not merely related to the availability of financial services but also to the ability of business owners to access and utilize such services to support business activities.

The relationships among these variables also suggest that financial inclusion may serve as a mechanism through which financial and technological capabilities are translated into business performance. Kurniasari et al. (2025) demonstrated that financial literacy, financial technology adoption, and access to finance are associated with business performance and sustainability through mediation mechanisms. Nareswari (2026) also examined the relationship between financial technology and financial inclusion in relation to

MSME performance through financial literacy among MSME owners using BCA Merchant. These findings demonstrate that the relationship between financial literacy, technology, financial access, and business performance is not necessarily straightforward. Financial inclusion may therefore function as a mechanism connecting the ability of business owners to understand and utilize financial services with business performance.

Previous studies also demonstrate that these relationships require further examination. Setiawan et al. (2026) found that facilitating conditions and performance expectations contribute to FinTech adoption and that FinTech adoption can strengthen financial inclusion among MSMEs. Meanwhile, Sutikno et al. (2024) found that financial technology adoption did not affect business sustainability and financial inclusion, whereas financial literacy affected both business sustainability and financial inclusion. These divergent findings indicate an empirical research gap, particularly concerning the consistency of the effects of financial technology and financial literacy on business outcomes. In addition, previous studies differ in geographical context, respondent characteristics, variables, and the mechanisms used to explain relationships among the variables.

The research gap becomes more evident when previous studies are compared in terms of their analytical models. Rohaeni et al. (2025) demonstrated that digital financial literacy and technology adoption can strengthen financial inclusion and MSME performance, while Tandilino et al. (2025) found that digital financial inclusion mediates the relationship between digital financial literacy and MSME performance. However, these studies did not specifically examine financial technology usage as a separate antecedent alongside digital financial literacy in explaining financial performance. Meanwhile, Hamam et al. (2026) positioned financial inclusion as a mediator between financial literacy, technology adoption, government policy, and MSME performance. Thus, an opportunity remains to examine a model that integrates digital financial literacy and financial technology usage as independent variables, financial inclusion as a mediating variable, and financial performance as the outcome within the context of MSMEs in Sidoarjo Regency.

This study employs Dynamic Capabilities Theory (DCT) as its theoretical foundation for explaining the relationships among the variables. Teece et al. (1997) conceptualized dynamic capabilities as an organization's ability to build, integrate, and reconfigure competencies in response to changing environments. From this perspective, digital financial literacy can be understood as a *sensing* capability because it enables MSME owners to identify

opportunities and risks within the digital financial environment. Financial technology usage can subsequently be viewed as a *seizing* capability because it reflects the ability of business owners to transform technological opportunities into concrete actions within business activities. Financial inclusion is positioned as part of the *transforming* process because it concerns the ability of business owners to access and optimize financial services to support changes in business management. This framework is consistent with Zunairoh and Wijaya (2024), who examined the relationship between fintech, financial inclusion, financial knowledge, and MSME performance in Indonesia.

The novelty of this study lies in developing a model that integrates digital financial literacy and financial technology usage as independent variables, financial inclusion as a mediating variable, and financial performance as the dependent variable among MSMEs in Sidoarjo Regency. The novelty also lies in its attempt to explain the mechanism through which the ability to understand digital finance and utilize financial technology can be translated into financial performance through financial inclusion. Najat (2025) found that financial inclusion significantly affects MSME performance, while the direct effects of financial literacy and financial technology were not significant. This finding indicates that access to and utilization of financial services should be considered when explaining MSME performance. Accordingly, this study seeks to provide a more integrated explanation of the relationship among digital capabilities, financial technology utilization, financial access, and business performance.

Based on the foregoing discussion, this study focuses on the effect of digital financial literacy and financial technology usage on MSME financial performance with financial inclusion as a mediating variable in Sidoarjo Regency. The study aims to analyze and examine the effect of digital financial literacy on MSME financial performance, determine the effect of financial technology usage on financial performance, analyze the effect of digital financial literacy on financial inclusion, examine the effect of financial technology usage on financial inclusion, and assess the effect of financial inclusion on MSME financial performance. Furthermore, this study aims to examine the mediating role of financial inclusion in the effects of digital financial literacy and financial technology usage on MSME financial performance in Sidoarjo Regency. The study is expected to provide empirical evidence regarding the mechanisms underlying MSME financial performance in response to the development of the digital economy.

METHODS

This study employed a quantitative approach using an explanatory research design. The quantitative approach was adopted to obtain and analyze objective data through statistical procedures, while the explanatory design was used to examine causal relationships among the research variables through hypothesis testing. The study focused on examining the effects of Digital Financial Literacy (X_1) and Financial Technology Usage (X_2) on MSME Financial Performance (Y), both directly and indirectly through Financial Inclusion (Z) as a mediating variable. The research was conducted among MSMEs located in Sidoarjo Regency, East Java. The research setting was selected because of the substantial MSME population in the region, which comprised 153,288 registered business units according to the data of the Sidoarjo Regency Office of Cooperatives and Micro Enterprises as of July 2026.

The study population consisted of all MSME owners registered with the Sidoarjo Regency Office of Cooperatives and Micro Enterprises. Given the broad scope of the overall population, the study defined an accessible population consisting of registered MSME owners who actively used digital technology and belonged to MSME associations or development communities, comprising 163 business units. Participants were selected using purposive sampling, in which respondents were chosen according to characteristics relevant to the objectives of the study. The sampling criteria required MSMEs to have been operating for at least two years, to have used digital media or financial technology, to have access to formal financial services, and to be willing to complete the questionnaire. Using the Slovin formula with a 5% margin of error, the minimum required sample was determined to be 116 respondents.

The research design operationalized four variables, each represented by five indicators, resulting in 20 research indicators. Digital Financial Literacy (X_1) was measured through knowledge of digital financial products and services, the ability to operate digital financial applications, awareness of digital financial risks, technology-based financial management, and general digital literacy. Financial Technology Usage (X_2) was measured through the use of digital payments, mobile or internet banking, fintech lending, the frequency of digital transactions, and the integration of fintech into operational activities. Financial Inclusion (Z) comprised ownership of bank accounts or e-wallets, access to formal loans, the use of microinsurance, ease of access to financial services, and the quality of financial services. MSME Financial Performance (Y) was measured through sales growth,

profit growth, customer growth, operational efficiency, and business sustainability. These indicators were employed to translate each research construct into measurable empirical dimensions that could be assessed by respondents.

The research instrument was a questionnaire containing 20 statements, with five items allocated to each research variable. A five-point Likert scale was used, consisting of Strongly Agree scored as 5, Agree as 4, Neutral as 3, Disagree as 2, and Strongly Disagree as 1. Before the main data collection, the instrument underwent content validation through expert judgment by the research supervisor. A pilot study was subsequently conducted with 30 respondents outside the research sample in Waru District, Sidoarjo Regency, to assess the validity and reliability of the instrument. Primary data were collected through questionnaires distributed directly to MSME owners in several districts and online through Google Forms disseminated via WhatsApp groups or social media communities of MSMEs in Sidoarjo Regency. Secondary data were used to support the primary data and were obtained from available documents and other relevant information sources.

Data analysis was conducted through several sequential stages. The first stage involved descriptive statistics to summarize respondent characteristics and the distribution of responses for each research variable. Instrument testing was then performed using Pearson Product Moment correlation for validity and Cronbach's Alpha for reliability. Classical assumption tests included normality, multicollinearity, heteroscedasticity, and linearity tests. Relationships among the variables were subsequently examined using path analysis with the assistance of IBM SPSS Statistics version 26 or AMOS. The path model was used to assess the direct effects of Digital Financial Literacy and Financial Technology Usage on Financial Inclusion, as well as the effects of Digital Financial Literacy, Financial Technology Usage, and Financial Inclusion on MSME Financial Performance. Hypothesis testing comprised the coefficient of determination (R^2), partial t-tests, and simultaneous F-tests. Finally, the mediating role of Financial Inclusion was examined using the Sobel test to determine the significance of the indirect effects of the two independent variables on MSME Financial Performance.

The study utilized data concerning MSMEs in Sidoarjo Regency within the research period documented in the thesis, with the registered MSME population recorded at 153,288 business units as of July 2026. The research procedures comprised instrument development based on the operational indicators, content validation through expert judgment, pilot testing

with 30 respondents, questionnaire distribution to the research sample, data processing, assumption testing, path analysis, and mediation testing. These procedures were designed to ensure that the empirical analysis could address the seven research objectives concerning the direct and indirect effects of Digital Financial Literacy and Financial Technology Usage on MSME Financial Performance through Financial Inclusion.

RESULTS

Respondent Characteristics

The study was conducted among 116 MSME owners in Sidoarjo Regency who met the predetermined criteria for participation. Respondent characteristics were examined based on gender, age, and educational attainment. The distribution of respondents is presented in Table 1.

Table 1. Respondent Characteristics

Charateristics	Category	Frequency	Percentage (%)
Gender	Female	78	67.24
	Male	38	32.76
Age	17-25 years	48	41.38
	26-35 years	39	33.62
	36-45 years	21	18.10
	>45 years	8	9.90
Education	Elementary school	5	4.31
	Junior high school	12	10.34
	Senior high school	55	47.41
	Diploma/Bachelor	44	37.93
Total		116	100

Source: Processed primary data.2026.

Table 1. Respondent Characteristics, The respondent distribution indicates that women constituted the majority of the sample, accounting for 67.24%, compared with 32.76% male respondents. In terms of age, the largest proportion belonged to the 17–25-year group (41.38%), followed by respondents aged 26–35 years (33.62%). Regarding educational attainment, 47.41% of respondents had completed senior high school, while 37.93% had a diploma or bachelor's degree.

Descriptive Statistics

Descriptive analysis was performed to identify the general response tendency for each research construct. Four variables were examined: Digital Financial Literacy, Financial Technology Usage, Financial Inclusion, and MSME Financial Performance.

Table 2. Descriptive Statistics of Research Variables

Variable	Mean	Highest Item Mean	Lowest Item Mean	General Interpretation
Digital Financial Literacy (X1)	3.89	3.94	3.80	High
Financial Technology Usage (X2)	3.41	3.50	3.31	Moderate/Good
Financial Inclusion (Z)	4.02	4.10	3.92	High
MSME Financial Performance (Y)	3.66	3.72	3.62	Good

Source: Processed primary data.2026.

Table 2. Descriptive Statistics of Research Variables, Digital Financial Literacy obtained a grand mean of 3.89, indicating a relatively high level of digital financial literacy among respondents. The highest mean was recorded for X1.3 (3.94), relating to respondents' understanding of the distinction between legitimate and illegal digital financial services, whereas X1.4 recorded the lowest mean (3.80), concerning awareness of online fraud schemes.

Financial Technology Usage recorded a grand mean of 3.41. The highest score was observed for X2.3 (3.50), associated with the use of fintech lending to address business capital constraints, while X2.5 obtained the lowest score (3.31), concerning the integration of financial technology into business operations.

Financial Inclusion produced the highest grand mean among the four constructs, at 4.02. The highest individual score was found for Z.1 (4.10), related to ownership of a bank account under the business name, while Z.3 recorded the lowest score at 3.92.

MSME Financial Performance recorded a grand mean of 3.66. The highest item mean was observed for Y1.1 (3.72), associated with increased sales volume, while Y1.3 recorded the lowest mean (3.62), relating to customer growth.

Instrument Validity

The validity of the research instrument was evaluated using the Pearson Product-Moment correlation. With 116 respondents and a 5% significance level, the critical correlation value was 0.1826. An item was considered valid when its calculated correlation coefficient exceeded this critical value.

Table 3. Validity Test Results

Variable	Items	Range of r-count	r-table	Result
Digital Financial Literacy (X1)	5	0.799–0.871	0.1826	All Valid
Financial Technology Usage (X2)	5	0.391–0.586	0.1826	All Valid
Financial Inclusion (Z)	5	0.455–0.575	0.1826	All Valid
MSME Financial Performance (Y)	5	0.514–0.729	0.1826	All Valid

Source: Processed primary data, 2026.

Table 3. Validity Test Results, All measurement items demonstrated calculated correlation coefficients greater than the critical value of 0.1826. Therefore, all 20 questionnaire items across the four constructs were considered valid and suitable for subsequent analysis.

Reliability Test

Reliability was assessed using Cronbach's alpha, with a minimum acceptable threshold of 0.60.

Table 4. Reliability Test Results

Variable	Number of Items	Cronbach's Alpha	Result
Digital Financial Literacy (X1)	5	0.854	Reliable
Financial Technology Usage (X2)	5	0.675	Reliable
Financial Inclusion (Z)	5	0.678	Reliable
MSME Financial Performance (Y)	5	0.761	Reliable

Source: Processed primary data, 2026.

Table 4. Reliability Test Results, The Cronbach's alpha values ranged from 0.675 to 0.854, exceeding the minimum criterion of 0.60 for all constructs. Digital Financial Literacy demonstrated the highest internal consistency ($\alpha = 0.854$), followed by MSME Financial Performance ($\alpha = 0.761$), Financial Inclusion ($\alpha = 0.678$), and Financial Technology Usage ($\alpha = 0.675$). Thus, all measurement instruments were considered sufficiently reliable for further statistical analysis.

Hypothesis Testing

The hypotheses were evaluated based on the statistical significance of the relationships between the independent, mediating, and dependent variables. The complete results are summarized in Table 5.

Table 5. Direct-Effect Hypothesis Testing

Hypothesis	Relationship	t-value	p-value	Direction	Decision
H1	Digital Financial Literacy → Financial Performance	-1.142	0.256	Negative	Rejected
H2	Financial Technology Usage → Financial Performance	-3.331	0.001	Negative	Rejected
H3	Digital Financial Literacy → Financial Inclusion	-1.152	0.252	Negative	Rejected
H4	Financial Technology Usage → Financial Inclusion	-3.786	<0.001	Negative	Rejected
H5	Financial Inclusion → Financial Performance	-1.493	0.138	Negative	Rejected

Souce: Processed primary data, 2026.

Table 5. Direct-Effect Hypothesis Testing, The hypothesis-testing results reveal that Digital Financial Literacy did not have a statistically significant effect on MSME Financial Performance ($t = -1.142$, $p = 0.256$). Although the estimated direction was negative, the relationship did not reach statistical significance.

Financial Technology Usage demonstrated a statistically significant relationship with MSME Financial Performance ($t = -3.331$, $p = 0.001$), but the direction of the relationship was negative. Consequently, the proposed hypothesis predicting a positive effect was not supported.

Digital Financial Literacy also failed to demonstrate a significant effect on Financial Inclusion ($t = -1.152$, $p = 0.252$). In contrast, Financial Technology Usage showed a statistically significant negative relationship with Financial Inclusion ($t = -3.786$, $p < 0.001$). Finally, Financial Inclusion did not significantly affect MSME Financial Performance ($t = -1.493$, $p = 0.138$).

Mediation Analysis

Financial Inclusion was examined as an intervening variable in the relationships between Digital Financial Literacy, Financial Technology Usage, and MSME Financial Performance. The mediation effects were evaluated using the Sobel test.

Table 6. Mediation Test Results

Hypothesis	Mediation Relationship	Sobel Z	p-value	Decision
H6	Digital Financial Literacy → Financial Inclusion → Financial Performance	-0.914	0.361	Rejected
H7	Financial Technology Usage → Financial Inclusion → Financial Performance	1.387	0.165	Rejected

Source: Processed primary data, 2026.

Table 6. Mediation Test Results, The Sobel test indicates that Financial Inclusion did not significantly mediate the relationship between Digital Financial Literacy and MSME Financial Performance. The Sobel statistic was -0.914 with a significance value of 0.361, which did not meet the conventional 0.05 significance threshold.

Similarly, Financial Inclusion did not significantly mediate the relationship between Financial Technology Usage and MSME Financial Performance. The Sobel statistic was 1.387 with a significance value of 0.165. Therefore, neither of the proposed mediation relationships was statistically supported.

Summary of Empirical Findings

The overall empirical evidence is summarized in Table 7.

Table 7. Proposed Test Result

Hypothesis	Proposed Relationship	Empirical Finding	Decision
H1	Digital Financial Literacy → Financial Performance	Negative, not significant	Rejected
H2	Financial Technology Usage → Financial Performance	Negative, not significant	Rejected
H3	Digital Financial Literacy → Financial Inclusion	Negative, not significant	Rejected
H4	Financial Technology Usage → Financial Inclusion	Negative, not significant	Rejected
H5	Financial Inclusion → Financial Performance	Negative, not significant	Rejected
H6	Digital Financial Literacy → Financial Inclusion → Financial Performance	No significant mediation	Rejected
H7	Financial Technology Usage → Financial Inclusion → Financial Performance	No significant mediation	Rejected

Source: Processed primary data, 2026.

Table 7. Proposed Test Result, Taken together, the findings indicate that none of the seven proposed hypotheses received empirical support. Two relationships were statistically significant but occurred in the opposite direction to that predicted: Financial Technology Usage was negatively associated with MSME Financial Performance and Financial Inclusion. Meanwhile, the remaining direct relationships and both mediation effects were statistically insignificant.

DISCUSSION

The findings demonstrate that the relationships among digital financial literacy, financial technology use, financial inclusion, and the financial performance of MSMEs in Sidoarjo Regency do not entirely conform to the directions proposed in the hypotheses. Descriptively, respondents demonstrated a relatively good level of digital financial literacy, with a grand mean of 3.89. Financial technology use recorded a grand mean of 3.41, indicating a fairly good level of utilization, while financial inclusion achieved the highest mean at 4.02. Financial performance was also categorized as good, with a grand mean of 3.66. These findings suggest that access to and awareness of digital financial services have developed considerably among the surveyed MSMEs; however, the existence of knowledge and access alone does not necessarily translate into improved financial outcomes. Digital financial literacy was found to have no significant effect on MSME financial performance. The partial test produced a t-value of -1.142 with a significance level of 0.256, leading to the rejection of the hypothesized positive relationship. This result indicates that knowledge concerning digital financial products and services does not automatically generate measurable improvements in business performance. Literacy should therefore be understood as an enabling capability rather than an outcome-producing mechanism in itself. Its potential economic value depends on whether knowledge is translated into effective financial practices, such as informed financing decisions, cost control, financial planning, and productive allocation of business resources. The relatively high level of digital financial literacy among respondents, therefore, should not be interpreted as evidence that such literacy has already been operationalized effectively within business management. The descriptive results reinforce this distinction: the highest literacy score concerned respondents' understanding of the distinction between legal and illegal digital financial

services, whereas awareness of online fraud risks recorded the lowest score, although it remained within the good category.

This finding is consistent with Nugraheni et al. (2025), as discussed in the study, which emphasizes that technology adoption alone is insufficient without adequate literacy and effective utilization. The present finding adds an important contextual dimension: even when literacy is already relatively good, its effect on business performance may remain limited when practical implementation is inadequate. It also complements Sugih (2024), who associated limited digital literacy with ineffective utilization of formal financial services and financial technology. Rather than simply confirming the importance of literacy, the current study indicates that the relationship between literacy and performance depends on the conversion of knowledge into concrete managerial behavior.

Financial technology use presents a different pattern. It has a statistically significant relationship with MSME financial performance, but the direction is negative. The path coefficient was -0.305, with a t-value of -3.331 and a significance level of 0.001. This finding contradicts the proposed positive hypothesis and differs from Fitrianita and Sinarwati (2024) and Putri et al. (2025), which reported positive effects. The negative coefficient should not, however, be interpreted as evidence that financial technology is inherently detrimental to MSMEs. Rather, it suggests that the consequences of digital financial technology depend substantially on the way it is adopted, integrated, and managed within the business.

Several contextual explanations are plausible within the evidence provided by the study. MSMEs may still be undergoing a transition from conventional to digital financial practices, during which initial investments, transaction costs, training requirements, and learning costs may temporarily reduce financial efficiency. Moreover, technology may be used predominantly for basic transactions rather than strategic functions such as financial management, data analysis, and operational integration. This interpretation is supported by the descriptive findings: the highest score for financial technology use concerned the use of fintech lending to address capital constraints, whereas the lowest concerned the integration of fintech into business operations. Consequently, increased reliance on digital financial services may not necessarily produce higher performance if such use is not accompanied by effective managerial integration. The finding is also compatible with Setiyawan and Tambunan (2026), who reported no direct effect of financial technology on performance,

and Sugih (2024), whose findings indicate that the relationship between fintech and MSME performance is dependent on the broader digital capability context.

The relationship between digital financial literacy and financial inclusion was likewise statistically insignificant. With a t-value of -1.152 and a significance level of 0.252, the proposed positive relationship was not supported. This result differs from Sutikno et al. (2024) and Martono and Febriyanti (2023), which reported positive relationships. One possible explanation lies in the already high level of financial inclusion among the respondents. Financial inclusion recorded a grand mean of 4.02, with the highest score associated with ownership of a business bank account, indicating that formal financial access was already relatively widespread. Under such conditions, additional improvements in digital financial literacy may not substantially alter whether an MSME is financially included. The finding therefore highlights an important distinction between financial knowledge and financial access: individuals may possess adequate access to formal financial services even when their depth of financial knowledge varies.

Financial technology use was also significantly related to financial inclusion, but the relationship was negative, with a beta coefficient of -0.338, a t-value of -3.786, and a significance level of 0.000. This result contrasts with Atarwaman et al. (2023) and Yanto et al. (2025), which identified positive relationships. The negative direction may indicate that fintech does not necessarily function as a bridge toward formal financial inclusion in the Sidoarjo MSME context. MSMEs that already possess adequate access to conventional banking services may have less need to rely intensively on fintech, whereas intensive fintech users may employ digital services as substitutes rather than as gateways to formal financial institutions. The study further suggests that fintech use may remain concentrated on payment-related activities rather than broader inclusive financial products such as productive financing and insurance. This distinction is important because the frequency of technology use should not be equated with the quality or depth of financial inclusion.

Financial inclusion itself was not found to have a significant effect on MSME financial performance. The t-value of -1.493 and significance level of 0.138 resulted in the rejection of the proposed positive relationship. This finding differs from Najat (2025) and Sutikno et al. (2024), which identified positive effects, but it is compatible with the possibility of a more complex relationship, as reflected in Hamam et al. (2026), which reported a negative relationship between financial inclusion and MSME performance. Access to bank

accounts or financing facilities does not necessarily improve business performance unless those resources are allocated productively. In the Sidoarjo context, the relatively high level of financial inclusion may therefore represent access rather than effective utilization. The study's discussion of the regional credit program, whose realized number of debtors remained below its target, further indicates that the availability of formal financing does not automatically result in productive financing utilization.

The absence of a significant mediation effect further reinforces this interpretation. The Sobel test produced a z-value of -0.914 for the indirect path from digital financial literacy through financial inclusion to financial performance and a z-value of 1.387 for the corresponding fintech pathway. Neither indirect effect was statistically significant. This result is consistent with Sutikno et al. (2024), which found that financial inclusion did not mediate the relationship between fintech and MSME performance. Theoretically, the finding suggests that financial inclusion does not operate as an automatic transmission mechanism through which digital financial capabilities are converted into improved financial outcomes. Access may be present, yet its contribution to performance depends on the quality, purpose, and effectiveness of utilization.

Theoretically, this study contributes to a more contextual understanding of the relationship between digital financial capabilities and MSME performance. Its central contribution is the demonstration that digital literacy, financial technology adoption, and financial inclusion should not be treated as inherently performance-enhancing factors. Their effects depend on how knowledge and access are translated into business practices. Practically, the findings suggest that MSME development programs should move beyond merely expanding access to financial services or encouraging technology adoption. Training and assistance should emphasize strategic utilization, including digital financial recordkeeping, assessment of transaction costs, responsible financing, cash-flow management, and the integration of digital financial tools into daily operations. For local governments, financial institutions, and MSME support organizations, continuous mentoring may therefore be more valuable than one-time technology adoption programs.

Several limitations should nevertheless be acknowledged. The study involved 116 MSME respondents in Sidoarjo Regency, which limits the extent to which the findings can be generalized to MSMEs in other geographical and socioeconomic contexts. The use of questionnaire-based measures also means that some variables reflect respondents'

perceptions rather than independently verified financial records. Furthermore, the R^2 value of 0.156 indicates that digital financial literacy, financial technology use, and financial inclusion explain only 15.6% of the variance in MSME financial performance, while the remaining 84.4% is attributable to factors outside the model. Future studies could therefore incorporate additional explanatory variables and employ longitudinal designs to examine whether the effects of digital financial practices emerge over a longer period. These limitations do not diminish the contribution of the study; rather, they indicate that MSME financial performance is a multidimensional phenomenon that cannot be adequately explained through digitalization and financial access alone.

CONCLUSION

This study demonstrates that the relationships among digital financial literacy, financial technology use, financial inclusion, and MSME financial performance in Sidoarjo Regency do not consistently follow the positive relationships proposed in the hypotheses. Digital financial literacy was found to have no significant effect on either financial performance or financial inclusion, indicating that relatively adequate knowledge does not necessarily translate into effective financial practices or broader access to formal financial services. Financial technology use, in contrast, had significant effects on both financial performance and financial inclusion, but the relationships were negative. This finding suggests that greater fintech utilization does not inherently generate better business outcomes or deeper financial inclusion, particularly when digital financial services remain primarily transactional and are not strategically integrated into business operations. Financial inclusion itself also had no significant effect on financial performance, demonstrating that access to formal financial services does not automatically improve MSME outcomes when such access is not accompanied by productive utilization. Furthermore, financial inclusion failed to mediate the relationships between digital financial literacy and financial performance as well as between fintech use and financial performance.

The study contributes to the understanding of MSME digital financialization by demonstrating that knowledge, technology adoption, and financial access should not be regarded as automatic determinants of improved business performance. Their value depends on how effectively they are incorporated into financial and operational management. Practically, MSME development initiatives should therefore prioritize not only access and

technology adoption but also strategic capabilities in digital bookkeeping, cash-flow management, productive financing, and financial decision-making. Future research should incorporate additional explanatory factors and employ longitudinal approaches to capture the longer-term consequences of digital financial transformation on MSME performance.

REFERENCES

Affandi, Y., Ridhwan, M. M., Trinugroho, I., & Adiwibowo, D. H. (2024). Digital adoption, business performance, and financial literacy in ultra-micro, micro, and small enterprises in Indonesia. *Research in International Business and Finance, 70*(Part B), 102376. https://doi.org/10.1016/j.ribaf.2024.102376

Ananda, D. F., Biduri, S., Nurasik, & Harianto, W. (2025). The effect of payment gateways, digitalization of MSMEs, financial literacy, and venture capital on MSME performance. *Berkala Akuntansi dan Keuangan Indonesia, 10*(2), 175–197. https://doi.org/10.20473/baki.v10i2.62803

Atarwaman, R., Gainau, P. C., & Muriany, W. N. C. (2023). Pengaruh Financial Technology terhadap Inklusi Keuangan UMKM Pengguna QRIS. *Jurnal Akuntansi Kontemporer, 15*(3), 143–154. https://doi.org/10.33508/jako.v15i3.4545

Choung, Y., Chatterjee, S., & Pak, T.-Y. (2023). Digital financial literacy and financial well-being. *Finance Research Letters, 58*, 104438. https://doi.org/10.1016/j.frl.2023.104438

Fitrianita, D., & Sinarwati, N. K. (2024). Pengaruh Literasi Keuangan, Teknologi Keuangan, dan Modal Usaha terhadap Kinerja Keuangan UMKM di Kabupaten Karangasem. *JIMAT (Jurnal Ilmiah Mahasiswa Akuntansi), 15*(4), 932–943. https://doi.org/10.23887/jimat.v15i04.75913

Hamam, Z. N., Purwidianti, W., Tubastuvi, N., & Rahmawati, I. Y. (2026). Financial inclusion as a mediator of financial literacy, technology adoption, and government policy on MSME performance. *Airlangga Journal of Innovation Management, 7*(1), 163–187. https://doi.org/10.20473/ajim.v7i1.82959

Hayati, S. N., Muzakki, K., Wicaksono, A., & Anwar, C. (2026). Pengaruh Pemahaman Literasi Keuangan dan Digital Payment terhadap Kinerja Keuangan Warung Madura di Kecamatan Candi Sidoarjo. *Bisnis-Net Jurnal Ekonomi dan Bisnis, 9*(1), 623–635. https://doi.org/10.46576/bn.v9i1.8776

Hazmi, Y., Aryati, A., Lianti, L., & Abral, E. (2025). Penerapan Financial Technology, Literasi, dan Inklusi Keuangan terhadap Peningkatan Kinerja UKM di Lhokseumawe. *Prosiding Seminar Nasional Politeknik Negeri Lhokseumawe, 8*(1), 55–59. https://e-jurnal.pnl.ac.id/semnaspnl/article/view/6789

Khoiroh, F., & Anwar, C. (2025). Peningkatan Pendapatan: Faktor Pengguna E-Commerce dan Financial Technology. *Jurnal Riset Akuntansi Aksioma, 24*(1), 150–161. https://doi.org/10.29303/aksioma.v24i1.484

Kurniasari, F., Abd Hamid, N., & Lestari, E. D. (2025). Unraveling the impact of financial literacy, financial technology adoption, and access to finance on small medium enterprises business performance and sustainability: A serial mediation model. *Cogent Business & Management, 12*(1), 2487837. https://doi.org/10.1080/23311975.2025.2487837

Martono, S., & Febriyanti, R. (2023). Pengaruh Inklusi Keuangan, Literasi Keuangan, dan Pengelolaan Keuangan terhadap Kinerja UMKM di Kota Salatiga. *Jurnal Ekonomi*

Pendidikan dan Kewirausahaan, 11(2), 153–168. https://doi.org/10.26740/jepk.v11n2.p153-168

Najat. (2025). *Pengaruh Literasi Keuangan dan Financial Technology terhadap Kinerja UMKM: Inklusi Keuangan sebagai Variabel Mediasi (Studi Kasus pada UMKM Kuliner di Kota Malang)* [Undergraduate thesis, Universitas Islam Negeri Maulana Malik Ibrahim Malang]. https://etheses.uin-malang.ac.id/76229/

Nareswari, A. N. (2026). *Pengaruh Financial Technology dan Financial Inclusion terhadap Kinerja UMKM melalui Financial Literacy pada Pelaku UMKM Pengguna BCA Merchant* [Undergraduate thesis, Universitas Pembangunan Jaya]. https://eprints.upj.ac.id/id/eprint/12872/

Nugraheni, P., Darma, E. S., & Muhammad, R. (2025). Adoption of digital technology and financial knowledge: Strategies for achieving sustainable performance of MSMEs. *Journal of Risk and Financial Management, 18*(11), 646. https://doi.org/10.3390/jrfm18110646

Putri, A., Mauliddah, N., Mahardhika, B., & Fatihudin, D. (2025). Literasi Keuangan, Inklusi Keuangan, dan Financial Technology: Dampaknya terhadap Sustainability UMKM Tarik Sidoarjo. *Jurnal Akuntansi: Transparansi dan Akuntabilitas, 12*(2), 79–87. https://doi.org/10.35508/jak.v12i2.19333

Ratnawati, K., Rokhim, R., Wati, C. R., & Dewanta, P. P. (2025). The impact of enhancing digital financial literacy on firm performance: Evidence from digitalisation in Indonesia. *International Journal of Technology Intelligence and Planning, 14*(1), 78–106. https://doi.org/10.1504/IJTIP.2025.150737

Rizky, W. A. (2025). *Pengaruh Literasi Financial Technology dan Kredit Usaha Rakyat terhadap Pendapatan pada UMKM di Kecamatan Candi Kabupaten Sidoarjo* [Undergraduate thesis, UPN "Veteran" Jawa Timur]. https://repository.upnjatim.ac.id/41818/

Rohaeni, N., Meutia, Indriana, I., & Januarsi, Y. (2025). Digital financial literacy and technology adoption for strengthening financial inclusion and MSMEs' performance in Banten, Indonesia. *Salud, Ciencia y Tecnología, 5*, Article 2227. https://doi.org/10.56294/saludcyt20252227

Septiani, R. N., & Wuryani, E. (2020). Pengaruh Literasi Keuangan dan Inklusi Keuangan terhadap Kinerja UMKM di Sidoarjo. *E-Jurnal Manajemen, 9*(8), 3214–3236. https://doi.org/10.24843/EJMUNUD.2020.v09.i08.p16

Setiawan, B., Rani, S., Emilda, Arifin, F., & Utami, D. (2026). Understanding FinTech adoption drivers for digital financial sustainability in urban and rural MSMEs. *Risks, 14*(4), 77. https://doi.org/10.3390/risks14040077

Sutikno, K. P., Fahmi, A., & Al-Mustofa, M. U. (2024). Pengaruh Adopsi Financial Technology dan Literasi Keuangan terhadap Keberlanjutan Usaha Mikro di Kabupaten Mojokerto. *Indonesian Journal of Development Studies, 3*(1), 131–143. https://journal.its.ac.id/index.php/ijds/article/view/7573

Tandilino, C., Pontoh, G. T., Darmawati, D., & Indrijawati, A. (2025). Digital financial inclusion as a mediator of digital financial literacy and government support in MSME performance. *International Journal of Financial Studies, 13*(4), 199. https://doi.org/10.3390/ijfs13040199

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

Zunairoh, & Wijaya, L. I. (2024). Fintech, social capital and performance of Indonesian MSMEs. *Millennial Asia, 15*(4), 1–20. https://doi.org/10.1177/09763996241284692