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The Role of Financial Literacy and Digital Financial Literacy in Non-Cash Payment Usage: Evidence from MSMEs in Salatiga, Indonesia

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***Abstract**: The development of digital technology urges MSMEs (Micro, Small and Medium Enterprises) or merchants to implement it. The objective of this research is to study the effects of financial literacy, digital financial literacy, and the characteristics of MSME owners or merchants or attributes of their business on the usage of non-cash payment methods by MSMEs or merchants in Salatiga City. Besides investigating the two concepts, this study also analyzes the influence of the characteristics of MSME owners or merchants and business characteristics on non-cash payment methods. Data for this research are collected using a sample of 51 respondents through a survey conducted in Salatiga, Indonesia. The technique used to analyze data is binomial regression combined with the backward elimination method. This research finds that the knowledge dimension of financial literacy, the attitude dimension of digital financial literacy, and the education level of the respondents have a positive effect on the utilization of non-cash payment methods, while the behavior and attitude dimension of financial literacy, and other MSME characteristics (gender, age, the gross total income of the family of the respondents, number of dependance in the family, the respondent role on the financial decision*

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making, business and product type) have insignificant effect on non-cash payment usage.

***Keywords**: MSME, merchant, digital payment, financial literacy, digital financial literacy*

Uloga finansijske pismenosti i digitalne finansijske pismenosti u korišćenju bezgotovinskih plaćanja: Dokazi iz mikro, malih i srednjih preduzeća u Salatigi, Indonezija

***Apstrakt**: Razvoj digitalne tehnologije podstiče mikro, mala i srednja poduzeća (MSME) ili trgovce na njenu primenu. Cilj ovog istraživanja jeste proučavanje učinaka finansijske pismenosti, digitalne finansijske pismenosti i karakteristika vlasnika MSME, trgovaca ili atributa njihovog poslovanja na korišćenje bezgotovinskih metoda plaćanja od strane MSME ili trgovaca u gradu Salatiga. Osim istraživanja ova dva koncepta, ova studija takođe analizira uticaj karakteristika vlasnika MSME ili trgovaca i poslovnih karakteristika. Podaci za ovo istraživanje prikupljeni su na uzorku od 51 ispitanika putem ankete provedene u gradu Salatiga u Indoneziji. Tehnika korišćena za analizu je binomna regresija u kombinaciji s metodom povratne eliminacije. Ovo istraživanje pokazuje da dimenzija znanja finansijske pismenosti, dimenzija stava digitalne finansijske pismenosti i stepen obrazovanja ispitanika imaju pozitivan uticaj na korišćenje bezgotovinskih metoda plaćanja, dok dimenzija ponašanja i stava finansijske pismenosti i druge karakteristike mikro, malih i srednjih poduzeća (pol, gosine, bruto ukupni prihod porodice ispitanika, broj izdržavanih osoba u porodici, uloga ispitanika u finansijskom odlučivanju, vrsta poslovanja i proizvoda) imaju neznatan uticaj na korišćenje bezgotovinskih metoda plaćanja.*

***Ključne reči**: mikro, mala i srednja preduzeća, trgovci, digitalno plaćanje, finansijska pismenost, digitalna finansijska pismenost*

1. Introduction

The advancement of technology drives a transformation into the payment system from cash to non-cash. The COVID-19 pandemic drives the development of digital marketing. It also boosts the development of cashless payment methods. Despite its rapid development, some MSMEs (Micro, Small, and Medium Enterprises) have not utilized digital payments. According to the government, in 2024, there were 65 million MSMEs in Indonesia (Waluyo, 2024). However, in early August 2024, only 27 million MSMEs applied digital

technology (Kemenpanrb, 2024). Hence, not all MSMEs adopt digital technology.

The same thing happens in Salatiga City. Based on previous research in 2022, 55% of MSMEs or merchants[6] have not applied digital payment methods, whereas 72% of consumers have used digital payments. MSMEs, or merchants, who do not adopt digital payments, will risk losing consumers who prefer digital payment transactions (Wahyudi et al., 2024). Hence, it is important to identify the factors that influence digital payment utilization.

Table 1. Distribution of MSMEs/Merchants and Consumers in Salatiga City by Digital Method

Survey Method			*Platform*	Frequency (Percentage)	Total
2021	MSMEs or Merchants	Pre-Pandemic Condition	Nondigital marketing	94 (62.67%)	150 (100%)
			Digital marketing	56 (37.33%)	
		Post-Pandemic Condition	Nondigital marketing	91 (60.67%)	150 (100%)
			Digital marketing	59 (39.33%)	
2022	MSMEs or Merchants		Cash	55 (55%)	100 (100%)
			Digital payment	44 (44%)	
	Consumers		Cash	28 (28%)	100 (100%)
			Digital payment	72 (72%)	
2023	MSMEs or Merchants		Cash	43 (69.35%)	62 (100%)
			Digital payment-non QRIS	19 (30.65%)	

Note: QRIS (Quick Response Code Indonesian Standard) is a digital payment by Bank Indonesia.

Data Source: Previous study results of the research team not published.

The past research of the research team in Salatiga City found that the benefit of digital payment according to consumers and MSMEs because it is practical characteristic (no need to carry cash, no need to worry about not having enough cash for payment, it can be executed using handphone, no need to provide the exact cash for payment or change, it can serve transaction from out of the city, it can be used to pay for a large amount). Moreover, it is safe from the risk of obtaining counterfeit money, minimizes the risk of losing money, and reduces physical contact. Other reasons for implementing digital payment, according to consumers or MSMEs, among others, are the availability of interesting facilities

[6] We differentiate between MSME that produces their own product and those who sell products produced by others. We called the later as merchants.

for the type of digital payment being used and the ease of access (because there are already many merchants who use it).

The previous research by the team in Salatiga City also found some obstacles for consumers and MSMEs in using digital payments. This is, among other things, because the application seems complicated for older respondents who lack technological skill, respondents who are unsupported by the necessary equipment, many consumers prefer paying cash, and because the transaction value is small.

Studies which analyze factors affecting the usage of cashless payment or digital payment on MSME have been numerous outside of Indonesia (Allen et al., 2022; Gupta et al., 2022; Kaur & Devi, 2022; Zulkifly et al., 2024), but the majority is in Indonesia (Aldhi et al., 2024; Apriani & Wuryandari, 2022; Aprilia & Vendy, 2024; Cahyani et al., 2023; Ekasari et al., 2021; Fadhilla & Purwanto, 2022; Febriani et al., 2023; Hermawan et al., 2022; Kusuma, 2020; Najib & Fahma, 2020; Palupi et al., 2022; Putri et al., 2023; Rafiani et al., 2024; Setyaningtyas & Suranto, 2024; Widayani et al., 2022; Widowati & Khusaeni, 2022; Yuniarta & Purnamawati, 2021).

Most of those studies use a model developed from one or several models or theories on technology adoption based on people's behavior, viz. TAM (Technology Acceptance Model) (Apriani & Wuryandari, 2022; Aprilia & Vendy, 2024; Cahyani et al., 2023; Purnamasari et al., 2020; Putri et al., 2023; Rafiani et al., 2024; Widowati & Khusaeni, 2022) or extended TAM (Najib & Fahma, 2020), UTAUT (Unified Theory of Acceptance and Use of Technology) (Aldhi et al., 2024) or *UTAUT* 2 (Febriani et al., 2023; Yuniarta & Purnamawati, 2021), TOE (Technology-Organization-Environment) framework (Ekasari et al., 2021; Kaur & Devi, 2022; Zulkifly et al., 2024), TRA (Theory of Reasoned Action) (Kaur & Devi, 2022; Zulkifly et al., 2024) or IRT (Innovation Resistance Theory) (Widayani et al., 2022).

Studies based on financial literacy (Hermawan et al., 2022; Kusuma, 2020; Palupi et al., 2022; Rafiani et al., 2024) or digital literacy (Fadhilla & Purwanto, 2022) on MSMEs are still limited. Nonetheless, researchers who study the effect of financial literacy (Alawi et al., 2020; Foster et al., 2022; Gufran et al., 2023; Pratiwi & Saefullah, 2022; Prete, 2022; Rafiani et al., 2024; Seldal & Nyhus, 2022; Suarni et al., 2024) or digital literacy (Palimbong et al., 2023; Prete, 2022; Ullah et al., 2022; Wahid et al., 2021) or digital financial literacy (Shehadeh et al., 2024; Siswanti, 2023) on cashless payment utilization on persons who are not the owner or manager of MSMEs such as students, consumers, adult people, are relatively quite a lot.

Most similar studies in the past used path analysis (Kusuma, 2020) or PLS-SEM (Partial Least Square – Structural Equation Modeling) as the analysis

technique (Foster et al., 2022; Hermawan et al., 2022; Pratiwi & Saefullah, 2022; Rafiani et al., 2024; Shehadeh et al., 2024; Siswanti, 2023; Ullah et al., 2022), but some utilize simple (Palimbong et al., 2023; Suarni et al., 2024) and multiple (Fadhilla & Purwanto, 2022; Palupi et al., 2022; Prete, 2022) ordinary least square (OLS) regression analysis, binary logistic regression (Seldal & Nyhus, 2022), Kruskal-Wallis test and Mann-Whitney test (Gupta et al., 2022), and descriptive statistics (Alawi et al., 2020). This study employs binary logistic regression, which is seldom used by previous studies, except by Seldal & Nyhus (2022). Nevertheless, the research object of Seldal & Nyhus (2022) is not MSME, but adult people in Norway.

Because there have been no research studies on the effect of financial literacy and digital financial literacy on the utilization of digital payments on MSMEs or merchants, this study aims to work on that. The study is carried out in Salatiga City.

Another difference between this study and studies that analyze financial literacy, or digital financial literacy is that in those studies, financial literacy and digital financial literacy are not analyzed based on their dimensions, except for Liu et al. (2025), who studied financial knowledge. Nonetheless, they did not study the other dimensions of financial literacy, nor of digital financial literacy. In this study, financial literacy and digital financial literacy are analyzed based on three dimensions, viz. knowledge, behavior, and attitude.

Besides the two concepts, this study also aims to analyze how the characteristics of MSME owners, or merchants, and business characteristics influence the application of cashless payment. Studies investigating the effects of respondent characteristics on the usage of cashless payment are limited (Gupta et al., 2022; Rafiani et al., 2024; Seldal & Nyhus, 2022). The difference between this study and those studies is that Seldal & Nyhus (2022) investigated the effect of gender, generation (age group), income, and education level of respondents (adult people in Norway), Gupta et al. (2022) analyzed the influence of age, education, business experience and gender of respondents (MSME's owner or manager), and Rafiani et al. (2024) studied the effect of income. While this study investigates not only the effects of gender, age, education, and income total, but also the influence of marital status, number of dependencies in the family, business type (MSME or merchant), product type (food or beverage, or service), and the role of the respondents on the financial decision making in the family.

Thus, this research has several contributions. First, it investigates the effects of both financial literacy and digital financial literacy, while the others only study either one of them. Second, it analyzes the dimensions of financial literacy and digital financial literacy, which none of the previous studies have done. Third,

we ensure that the respondents in this research are owners or managers of MSMEs. it is not clear whether this was done in the other studies. Lastly, it is investigating some characteristics of the respondent that have never been studied in previous studies.

2. Literature Review

2.1. Digital Payment

Digital payment is also called electronic payment or cashless (non-cash) payment. It is a payment that involves no physical money (Febriani et al., 2023; Pang et al., 2022; Singhal & Gupta, 2021) or is excuted by digital currencies (Thirupathi et al., 2019). The transaction is executed using electronic media (Febriani et al., 2023; Nubika, 2018) and online employing servers, applications, and networks (Nubika, 2018) or financial technology (Pang et al., 2022), such as mobile applications or websites (Singhal & Gupta, 2021). World Bank (2022) defines digital payment as a cashless transaction that is processed virtually or electronically. The transaction can be made at all times globally (Singhal & Gupta, 2021). In Indonesia, these are carried out through money transfer, cheques, debit notes, card-based payment instruments, card-based electronic money, and server-based electronic money (Bank Indonesia, 2025).

2.2. Financial Literacy

Financial literacy is a combination of knowledge, skills, and beliefs that influence attitudes and behavior, which improve the quality of decision-making and financial management to achieve the society's financial well-being (OJS, 2024). According to Tamplin (2023), financial literacy refers to the mastery and effective use of financial skills from budget and savings management to debt and retirement planning. According to Foster et al. (2022), financial literacy refers to the ability to make financial decisions based on financial knowledge, carry out financial management, make appropriate decisions, and plan. According to Suarni et al. (2024), financial literacy is needed to prevent someone from making financial mistakes.

OECD (2023) defines financial literacy as a combination of financial awareness, knowledge, skills, attitudes, and behaviors needed to make good financial decisions to achieve financial well-being. Thus, there are three dimensions of financial literacy, i.e., financial knowledge, financial behavior, and financial attitude (OECD, 2023).

2.3. Digital Financial Literacy

In simple words, digital financial literacy is a combination of financial literacy and digital literacy (Ravikumar et al., 2022) or financial literacy in digital platforms (Lyons & Kass-Hanna, 2021). Digital financial literacy is the knowledge and skills needed to execute financial transactions on digital platforms (Choung et al., 2023). It combines the skill needed to direct financial services with the skill to apply digital technology.

Some people also say that digital financial literacy is not only knowledge and skill but also includes financial awareness and experience to adopt a cashless payment system (Shehadeh et al., 2024), or a belief and competency to safely use financial products and services to make the right financial decision (AFI, 2021).

OECD (2023) defines digital financial literacy as a combination of knowledge, skills, attitudes, and behaviors needed to apply digital financial services and technologies safely. Hence, there are 3 dimensions in digital financial literacy, viz., digital financial knowledge, digital financial behavior, and digital financial attitude (OECD, 2023).

2.4. Hypothesis

The higher someone's financial literacy, the more likely they are to use digital payments. Although Cruijsen et al. (2025) found financial literacy has no effect on digital payment usage, most previous studies found evidence that financial literacy has a positive effect on digital payment utilization (Fadhilla & Purwanto, 2022; Foster et al., 2022; Hermawan et al., 2022; Kusuma, 2020; Palimbong et al., 2023; Palupi et al., 2022; Prete, 2022; Seldal & Nyhus, 2022; Suarni et al., 2024; Ullah et al., 2022). Liu et al. (2025) specifically found evidence that financial knowledge has a positive effect on digital payment applications. Therefore, this study proposes these hypotheses:

H_{1a}: The knowledge dimension of financial literacy has a positive effect on the usage of digital payment

H_{1b}: The behavior dimension of financial literacy has a positive effect on the usage of digital payment

H_{1c}: The attitude dimension of financial literacy has a positive effect on the usage of digital payment

The higher someone's digital financial literacy, the more likely they are to utilize digital payment. Siswanti (2023) found that digital financial literacy has a positive influence on the application of digital payment, either directly or through

cultural variables. Whereas Cruijsen et al. (2025) and Prete (2022), who did not study digital financial literacy but digital literacy, found that digital literacy has a positive effect on the use of digital payment. Contrarily, Shehadeh et al. (2024) found that digital financial literacy does not affect the use of cashless payment. Therefore, this study formulates these hypotheses:

H_{2a}: The knowledge dimension of digital financial literacy has a positive effect on the use of digital financial payment

H_{2b}: The behavior dimension of digital financial literacy has a positive effect on the use of digital financial payment

H_{2c}: The attitude dimension digital financial literacy has a positive effect on the use of digital financial payment

Seldal and Nyhus (2022) found that female gender has a positive effect on several types of digital payment being studied. Liu et al. (2025) also found that females tend to be involved in digital payments. Cruijsen et al. (2025) found that gender has an influence on various digital payments for household tasks. On the contrary, Gupta et al. (2022) found there is no difference in the acceptance of fintech services between male and female respondents. Furthermore, the digital marketing application usually drives digital payment utilization, and Fevriera et al. (2023) also found that gender has no effect on the digital marketing utilization in Salatiga. Thus, this study suggests this hypothesis:

H_{3a}: Gender affects the utilization of digital payment

The usage of digital marketing tends to encourage the employment of digital paymens. Fevriera et al. (2023) found that age has a negative effect on the digital marketing usage in Salatiga. Seldal and Nyhus (2022) found that the X generation (born 1965-1980), the baby boomer generation (born 1946-1964), and the silent generation (born 1928-1945) have a negative influence on all or several types of digital payment being investigated. Liu et al. (2025) also found evidence that four age groups of 35 years old and above (35-44, 45-54, 55-64, and 65+) have a negative effect on the digital payment utilization. Cruijsen et al. (2025) found evidences that that three age groups from 45 years old (45-54, 55-64, and 65+) have a negative effect on either one or all of the usage of mobile phone and smarth watch, but four age groups from 35 years old (35-44, 45-54, 55-64, and 65+) have a positive effect on digital payment use. Pratiwi and Saefullah (2022) also found that financial literacy has a positive influence on the application of payment technology beyond the perception of ease in digital payment. However, Gupta et al. (2022) found that the acceptance of fintech services is not different among the age groups being studied. Therefore, the study proposes this hypothesis:

H_{3b}: Age has a negative effect on the application of digital payment

The application of digital payment requires financial back-up to provide supporting equipment such as cell phones or computers, and internet subscriptions. Hence, the higher one's income, the higher the tendency of him or her to use digital payments. This is strengthened by Rafiani et al. (2024), Liu et al. (2025), and Seldal and Nyhus (2022), who found that income has a positive effect on the application of or interest in using digital payments. Hence, this study formulates this hypothesis:

H_{3c}: Income has a positive effect on the usage of digital payment

The higher someone's education level, the more likely they are to use digital payments. The study of Liu et al. (2025) supports this tentative conclusion with their finding that education has a positive effect on digital payment. Seldal and Nyhus (2022) also found that higher education has a positive effect on one of the types of digital payment being analyzed. However, Gupta et al. (2022) found there is no difference in the acceptance of fintech services among the education groups being studied. Thus, this study suggests this hypothesis:

H_{3d}: Education has a positive effect on the use of digital payment

Studies investigating characteristics of MSME owners or characteristics of MSMEs are limited. However, these characteristics are suspected to have an influence on the application of digital payments. Liu et al. (2025) found that marital status has no effect on digital payment usage. Fevriera (2023) also found that types of products (agriculture/industry and service) have no effect on digital marketing utilization. Liu et al. (2025) also found that the respondent's role in financial decision-making influences the digital payment use. Therefore, this study proposes the following hypotheses:

H_{3e}: Marital status affects the utilization of digital payment

H_{3f}: The number of dependencies in the family affects the utilization of digital payment

H_{3g}: Business type affects the utilization of digital payment

H_{3h}: Production type affects the utilization of digital payment

H_{3i}: The respondent's role in the financial decision-making in the family affects the utilization of digital payment

3. Research Methodology

3.1. Research Area

Salatiga City is located in the province of Central Java, Indonesia. It is a small city with an area of 54.98 km^2 (BPS, 2025) and a total population of 198,971 (BPS Salatiga, 2025b). In 2024, the GRDP (Gross Regional Domestic Product) of Salatiga is 18,079.27 billion IDR (BPS Salatiga, 2025a). In 2023, there were 1,611 small and medium industries in Salatiga (BPS Salatiga, 2024c). In 2024, the labor force (aged 15 years and above) was 79% and the productive age (15-64) was 70% of the total population (BPS Salatiga, 2024a). Most of the labor force (57%) graduate from high school, 19% only graduate from primary school, and the rest graduate from college (BPS Salatiga, 2024b).

Unfortunately, the Statistics Bureau of Salatiga (BPS) has no information on internet penetration/usage, and there has been no research on it. Therefore, that specific data is not available.

3.2. Sample Size and Sampling Technique

The data for this study are primary data collected from a survey. The sample size was determined by considering the results from previous research, in which the proportion of MSMEs or merchants that use digital payment other than QRIS is 69.35% (see Table 1). Furthermore, the proportion was assumed to represent the population proportion of MSMEs or merchants who currently use digital payments (p). If from the sample of this study, the research team wants to be able to construct an interval estimation for the population proportion of MSMEs or merchants who use digital payment with a confidence level of 90% and error tolerance of not more than 12% (e), the minimum sample size that should be obtained (Keller, 2023) is:

$$n_{\text{minimal}} = \left(\frac{Z}{e}\right)^2 \times p \times (1-p) = \left(\frac{1{,}645}{12\%}\right)^2 \times 69{,}35\% \times (1-69{,}35\%) \approx 40 \quad (1)$$

where: Z = value from the normal distribution table for the interval estimation of proportion with a confidence level of 90%.

To avoid bias, the questionnaire was distributed directly to the respondents (face-to-face), that is, before we gave a seminar on financial literacy, digital financial literacy, and financial management. During data collection, some enumerators were available to explain difficult questions, such as those of economic concepts, and how to answer the questionnaire.

Due to budget limitations, we were only able to invite 70 people, and only 65 of them attended the seminar. The invitations were distributed to MSMEs that

became our respondents in our previous research in 2022, and to merchants by the leader of the morning market merchant association in Salatiga. After being validated, there are 8 missing data, therefore only 57 data left. Then, STATA (the statistical software) dropped six data. Eventually, the sample data that could be used to estimate the regression model is only 51 which still meets the minimal sample size needed to meet the criteria expected by the research team.

The questions in the questionnaire were developed by referring to some sources (Anshika, Singla, & Malli, 2021; CDPB, 2023; Chen & Volpe, 1998a; Dewi, Febrian, & Effendi, 2020; Kartini & Mashudi, 2022; Lyons & Kass-Hanna, 2021a; Melbourne Institute, 2020; OECD, 2023b; Ouachani et al., 2021; Sinani, 2021), and then we adapted them so that they fit with the conditions in Salatiga.

3.3. Analysis Technique

This study uses binary (binomial) logistic (logit) regression analysis because the dependent variable in this study is a qualitative variable with 2 categories (Gujarati, 2015; Studenmund & Johnson, 2017). Table 2 displays variables names, definitions, and measurement scales.

Table 2. Definition and Measurement Scale of Variables

Var.	Definition	Unit Measurement
DP	Digital payment utilization	1 = yes, 0 = no
FK	Knowledge dimension of financial literacy	Consist of 5 indicators. Each indicator is in nominal scale: 100 = right answer, 0 = wrong answer. The score of *FK* is the total score of all indicators.
FB	Behavior dimension of financial literacy	Consists of 9 indicators. Each indicator is in nominal scale: 100 = right answer, 0 = wrong answer. The score of *FB* is the total score of all indicators.
FA	Attitude dimension of financial literacy	Consists of 3 indicators. Each indicator is in ordinal scale: 100 = 1 (the right attitude), 75 = 2, 50 = 3, 25 = 4, 0 = 5 (the wrong attitude). The score of *FA* is the total score of all indicators.
DFK	Knowledge dimension of digital financial literacy	Consists of 4 indicators. Each indicator is in nominal scale: 100 = right answer, 0 = wrong answer. The score of *FDK* is the total score of all indicators.
DFB	Behavior dimension of digital financial literacy	Consists of 4 indicators. Each indicator is in nominal scale: 100 = right answer, 0 = wrong answer. The score of *FDB* is the total score of all indicators.
DFA	Attitude dimension of digital financial literacy	Consists of 3 indicators. Each indicator is in ordinal scale: 100 = 1 (the right attitude), 75 = 2, 50 = 3, 25 = 4, 0 = 5 (the wrong attitude). The score of *FDA* is the total score of all indicators.
Gender	Respondent sex	1 = male, 0 = female
Age	Respondent age	years old
Income	The gross total income of the family of MSME or merchant owners (the business turnover, the income of MSME owners/merchants from other permanent jobs, and income from other family members)	IDR per month
Education	Respondent education	1 = not going to school or not graduating from primary school, 2 = primary school, 3 = junior high school, 4 = senior high school, 5 = diploma, 6 = bachelor's degree, 7 = master's degree, 8 = doctoral degree
Status	Marital status	1 = married, 0 = not married
Depend.	Number of dependents in the family, measured as a self-reported count	People
Business	Business types	1 = merchant, 0 = MSME
Product	Product types	1 = food or beverage product, 0 = service
Role	The respondent role on the financial decision making in the family	100 = the respondent is the one who makes a financial decision in the family, 50 = the financial decision in the family is made by the respondent and other people, 0 = the respondent is not involved in the financial decision making in the family

Furthermore, the early estimation phase for model (1) shows that *DFK* and *DFB* variables must be excluded from the model cause those variables predict perfectly, so that model (1) could not be estimated. Besides that, data processing software also automatically excludes *Status* variables because it predicts the success event perfectly. Hence, because hypotheses H_{2a}, H_{2b}, and H_{3e} cannot be tested, model (1) changes into:

$$L_i = ln\left(\frac{P(\text{DP} = 1)}{P(\text{DP} = 0)}\right) = Z_i = b_0 + b_{11}\cdot FK_i + b_{12}\cdot FB_i + b_{13}\cdot FA_i + b_2\cdot DFA_i + \sum_k b_{3k}\cdot K_{ki} + e_i \quad (2)$$

where: $L_i = Z_i$ = logit or log of odd ratio in which odd ratio = $\frac{P(\text{DP} = 1)}{P(\text{DP} = 0)}$ with i = index for MSMEs or merchants, ln = natural logarithm, P = probability = $\frac{1}{1 + e^{-Z_i}}$, b_0 = constant of model (2), b_{1j} = regression coefficient of the j^{th} dimension of financial literacy variable with j = {knowledge, behavior and attitude}, b_2 = regression coefficient of attitude dimension of digital financial literacy variable, b_{3k} = regression coefficient from k^{th} characteristics of MSME owners or merchant or business characteristics variable with k = {*Gender*, *Age*, *Income*, *Education*, *Dependance*, *Business*, *Product*, *Role*}, e = residual model (2).

Before the model estimation, we ensure that there is no multicollinearity problem in all quantitative independent variables. Table 3 shows that there is no Pearson correlation (linear correlation) between quantitative variables in the model which is more than 0.9.

Table 3. Pearson Correlations Among Quantitative Independent Variables

	Age	***Education***	***Dependance***	***Income***	***Decision***	***FK***
Age	1.000					
Education	–0.203	1.000				
Dependance	0.047	–0.114	1.000			
Income	–0.357	0.231	–0.328	1.000		
Decision	0.153	–0.102	–0.194	0.196	1.000	
FK	–0.076	–0.009	–0.129	0.180	0.109	1.000
FB	–0.205	0.343	–0.086	0.267	0.147	0.135
FA	0.019	–0.140	–0.140	0.051	0.097	0.178
DFA	–0.066	–0.314	–0.314	0.011	0.037	0.175

	FB	***FA***	***DFA***
FB	1.000		
FA	0.109	1.000	
DFA	0.217	.286	1.000

Data Source: survey data processing by the research team

Next, this study also adopts the independent variable selection technique using stepwise regression with a backward method (Gujarati & Porter, 2009; Studenmund & Johnson, 2017; Wooldridge, 2020). First, all variables are entered into the model, then they are selected one by one to determine whether they can be maintained in or should be excluded from the model. Variables that are included in the model are those with significant effects.

Variables that are excluded from the model are guaranteed to be insignificant. This model is chosen to determine the ability of significant variables to explain the variation in the logit value, with no other independent variables whose influence is insignificant.

The stepwise regression method is often not recommended because the chosen model might not be justified theoretically, and/or it can result in regression coefficients with unpredictable signs (Studenmund & Johnson, 2017). Despite eliminating variables from the model, it is suggested to accept circumstances, that data not collected based on experimental design, is sometimes uninformative about the parameter being investigated (D. N. Gujarati & Porter, 2009). Nonetheless, this method can be used in exploratory research where there is no theory or when there are only a few theories underlying the chosen variable (Bougie & Sekaran, 2020). The technology adoption theory that has been developed so far is based on human behavior psychology (*TAM*, *UTAUT*, *TOE*, *TRA*) and not on financial concepts. It has been explained that studies analyzing the influence of financial literacy are limited, and those investigating the effect of digital financial literacy are very limited. There are no previous studies that have studied the effects of dimensions of financial literacy and digital financial literacy. Also, studies that investigate the characteristics of respondents are still limited, and there is no theory on them. Therefore, this study can be categorized as an exploratory study.

The stepwise regression method can also be used when there are many independent variables in the model. To reduce the number of variables or to select variables so that the model becomes simpler, the stepwise regression method can be applied (Walpole et al., 2016) because including independent variables whose effects are insignificant will increase the determinant coefficient value (R^2).

The weakness of this method is that there is a possibility that the effect of an independent variable, which theoretically has a causal relationship with the dependent variable, becomes insignificant, while the effects of independent variables outside the theory (nuisance variables) happen to be significant (Smith, 2018). In other words, the result of the model estimation cannot be generalized.

The regression coefficient signs of the backward stepwise regression method (see Table 4) are the same as those of the model without the backward stepwise regression method (see Table 3), and this is also consistent with the theory. Moreover, so that the model fulfills the homoscedasticity assumption, it is estimated using robust standard errors.

3. Results and Discussion

Table 4 presents the estimation results of the binary logistic regression, and Table 5 displays the estimation results of the binary logistic – backward stepwise regressions.

Table 4. The Estimation Result of Binomial Logistic Regression

Logistic Regression			Number of obs =	51
			Wald $Chi^2(12)$ =	22.06
			Prob > chi^2 =	0.0369
Log pseudolikelihood = –25.4332			Pseudo R^2 =	0.2544
Independent Variables	**Coefficient**	**Robust Standard Error**	**Z**	***p-value***
FK	0.0125	0.0056	2.24	0.013 **
FB	0.0007	0.0027	0.26	0.396
FA	0.0005	0.0072	0.07	0.472
DFA	0.0147	0.0090	1.64	0.051 *
Gender	0.7557	1.4530	0.52	0.302
Age	–0.0309	0.0482	–0.64	0.261
Education	0.7443	0.3565	2.09	0.019 **
Dependance	0.3213	0.2504	1.28	0.199
Business	–0.0493	1.1865	–0.04	0.967
Product	–0.4624	0.9918	–0.47	0.641
Income	3.40e–08	3.47e–08	0.98	0.164
Role	0.0054	0.0207	0.26	0.796
Constant	–11.6239	3.7695	–3.08	0.002 ***

Notes: (1) The *p-value* has been adjusted to the formulated hypothesis, whether it is one or two-sided. (2) *, **, *** mean significant at α = 10%, 5%, 1%.
Data Source: survey data processing by the research team

The chosen independent variables in the model, that is, the education level of MSME owners/merchants, the knowledge dimension of financial literacy, and the attitude dimension of digital financial literacy, can only explain 21.90% (see Table 5) of the variation value of the ratio between the probability of MSMEs/merchants who use and do not use digital payment. If the independent variables with insignificant influences are not excluded from the model, they can explain 25.44% (see Table 4) of the variation in the ratio between the probability of MSMEs, or merchants, who apply and do not apply for digital payments. Next, because it is difficult to use the coefficient of the binary logistic regression in explaining the effects of changes in the independent variables on

the usage of digital payments, Table 6 presents the estimation of the marginal effect.

From Tables 4 and 5 it can be concluded that gender, age of MSME owners or merchants, number of dependences in the family of MSME owner or merchants, business type, product type, gross income of the family of MSME owners or merchants, the role of MSME owners or merchants in the financial decision making in his or her family, behavior, and attitude dimensions of financial literacy have no influence on the use of digital payment. The decision of digital payment utilization by MSME performers or merchants seems not affected by market demands (the condition of competitors in the market, nor consumers' demand).

Table 5. The Estimation Results of Binomial Logistic – Backward Method Regression

Logistic Regression		Number of obs =	51
		Wald $Chi^2(2)$ =	12,68
		Prob > chi^2 =	0,0054
Log pseudolikelihood = −26,6762		Pseudo R^2 =	0,2190
Independent Variables	**Coefficient (Robust Standard Error)**	***Z* (p-value)**	
FK	0.0110	2.13	
	(0.0052)	(0.017)	**
DFA	0.0123	1.53	
	(0.0081)	(0.063)	*
Education	0.7118	2.53	
	(0.2810)	(0.006)	***
Constant	−9.9394	−3.30	
	(3.0092)	(0.001)	***

Notes: (1) The *p-value* has been adjusted to the formulated hypothesis, whether it is one or two-sided. (2) *, **, *** mean significant at α = 10%, 5%, 1%.
Data Source: survey data processing by the research team

The effect of the knowledge dimension of financial literacy is significant. Hence, hypothesis H_{1a} is not rejected. The result strengthens the findings by Fadhilla and Purwanto (2022), Foster et al. (2022), Hermawan et al. (2022), Kusuma (2020), Liu et al. (2025), Palimbong et al. (2023), Palupi et al. (2022), Prete (2022), Seldal and Nyhus (2022), Suarni et al. (2024), and Ullah et al. (2022) who find that financial literacy has a positive effect on the usage of digital payment.

Table 6. The Estimation Results of the Marginal Effect of Binomial Logistic – Backward Method Regression

Average Marginal Effect	Number of obs =	51
Model *VCE*: Robust		
Expression: Pr(*DP*), predict()		
dy/dx *wrt*: *FK DFA Education*		

dy/dx (Delta-method Standard Error)	***Z*** **(p-value)**	
0.0019	2.48	
(0.0008)	(0.007)	***
0.0022	1.64	
(0.0013)	(0.050)	**
0.1243	3.01	
(0.0413)	(0.002)	***

Notes: (1) Dependent variable = *DP*. (2) The *p-value* has been adjusted to the formulated hypothesis, whether it is one-sided or two sided. (3) *, **, *** mean significant at α = 10%, 5%, 1%. Data Source: survey data processing by the research team

The influence of the attitude dimension of digital financial literacy is also significant. So, hypothesis H_{2c} is not rejected. This result supports the findings by Cruijsen et al. (2025), Siswanti (2023), and Prete (2022), who each found that digital financial literacy and digital literacy have a positive influence on the application of digital payment.

The effect of the education level of MSME owners or merchants is significant. Hence, hypothesis H_{3d} is not rejected. This result is in accordance with the findings by Seldal and Nyhus (2022) and those of Liu et al. (2025).

The knowledge dimension of financial literacy has a significantly positive influence on digital payment applications. An increase in the knowledge dimension of financial literacy by 100 points will increase the probability of digital payment utilization by MSME owners or merchants by 19% (see Table 6). It means that the better financial knowledge of MSME owners or merchants, the greater their possibility of using digital payment. In this study, the indicators of the knowledge dimension of financial literacy are inflation, investment, present value of money, interest rate, and compound interest.

The significant effect of the financial knowledge dimension might be due to its high average score (see Table 7). The indicator with the low score is the knowledge of how to calculate the interest rate for a period.

Table 7. Indicator Scores of Financial Knowledge

Indicators	Average Score	Category (Chen & Volpe, 1998)
Inflation definition	100.00	High
Investment with high risk	94.12	High
Calculate the saving interest in two periods	86.27	High
Time value of money	78.43	Medium
Calculate interest rate for one period	**58.82**	**Low**
Financial Knowledge	85.53	High

Notes: 100 = the best, 0 = the worst.
Data Source: survey data processing by the research team

The attitude dimension of digital financial literacy has a significantly positive effect on the utilization of digital payment. An increase in the score of the attitude dimension of digital financial literacy by 100 points will raise the probability of utilizing digital payment usage by MSME owners or merchants by 22% (see Table 6). It means that the better the attitude of MSME owners or merchants in digital financial transactions, the greater their likelihood of using digital payments. In this study, the indicators of the attitude dimension of digital financial literacy are attitudes associated with the use of public Wi-Fi, checking website security before transactions, and the importance of reading the online shopping provisions.

The significant effect of the digital financial attitude dimension might be due to its medium average score (see Table 8). The indicator with the low score is the attitude toward public Wi-Fi usage. It shows that many respondents prefer to use public Wi-Fi because it is free. They are not aware that it is unsafe for financial transactions.

Table 8. Indicator Scores of Digital Financial Attitude

Indicators	Average Score	Category (Chen & Volpe, 1998)
Reading the online shopping provisions is important	83.33	High
Checking website security before transactions	77.45	Medium
The usage of public Wi-Fi is unsafe	**56.86**	**Low**
Digital Financial Attitude	72.55	Medium

Notes: 100 = the best, 0 = the worst.
Data Source: survey data processing by the research team

Furthermore, the education level of MSME owners or merchants also has a significantly positive effect on digital payment utilization. MSME owners or merchants with one level higher will increase the probability of applying digital payments by MSME by 12.43% (see Table 6). It means that the higher the education level of MSME owners or merchants, the more likely they are to use

digital payment. It must be because the higher the education level, the greater the ability to learn better, including learning financial literacy and digital financial literacy.

The significant effect of education is due to the adequate education level of most respondents, viz, senior high school to bachelor's degree (see Table 9).

Table 9. Education Distribution

Indicators	Percentage
Senior high school	**43%**
Bachelor's degree	**24%**
Diploma	**20%**
Primary school	8%
Junior high school	4%
Master's degree	2%
Not going to school or not graduating from primary school	0%
Doctoral degree	0%

Data Source: survey data processing by the research team

4. Conclusion

The objective of this study is to analyze the effects of the dimensions of financial literacy and digital financial literacy, the characteristics of MSME owners or merchants, and business characteristics in Salatiga City. This study finds that the knowledge dimension of financial literacy, the attitude dimension of digital financial literacy, and the education level of MSME owners or merchants have significant positive effects on digital payment utilization. The results of this research indicate that individual knowledge becomes the main factor in the decision to apply digital payment. Therefore, to increase the success of the government GNNT program (the National Cashless Movement), the government should enhance financial literacy training, especially in the knowledge dimension, and augment digital financial literacy training especially in the attitude dimension. Educating MSME owners or merchants should be focused on indicators with low and medium scores.

In organizing the training, the government can optimize financial literacy socialization, which has been done by the Indonesian Financial Services Authority (OJK) in collaboration with schools, at the elementary level (primary school) and secondary level (junior and senior high school). The government can also work with various parties. Education does not have to be deliberate in terms of face-to-face training, offline and online, but also in the form of advertising through television media or other internet platforms, such as YouTube, TikTok, etc.

To overcome the problem of old MSME owners or merchants who often lack technological skills, the government can guide them, particularly until they are able or get used to doing it independently. This method has been used in developed countries (AgeUK, 2023; Australian DSS, 2024; Jun Ji-hye, 2024; Singapore Government, 2020). The government can run this program by cooperating with higher education institutions. On one hand, the government can increase the success of the GNNT program, and on the other hand, the higher education institutions can do their community service activities, which become one of the three demands of dharma education for lectures in higher education.

This research has several limitations. First, the sample size is small. Second, the questionnaires have not included questions about ownership of supporting facilities to adopt digital technology, such as internet access, smartphones, laptops, or personal computers. Third, the number of indicators for several dimensions of financial literacy or digital financial literacy is less than five. Those aspects must be improved in future research.

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