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# Analysis of the financial literacy index of MSMEs 4.0 and its determinants

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## ABSTRACT

The financial literacy index of the Indonesian population has increased, yet cases of illegal online loan scams and fraudulent online transactions remain high due to low financial literacy. This study analyzes the financial literacy index of MSME 4.0 entrepreneurs in Tebing Tinggi City and its determinants to support the formulation of appropriate policies. The examined variables include education level, age, business turnover, and gender. Primary data were collected through questionnaires from 100 MSME entrepreneurs using e-commerce and social commerce platforms. Data analysis was conducted using multiple linear regression. The results indicate that the financial literacy index of MSME 4.0 entrepreneurs in Tebing Tinggi City is relatively high (82.26 percent). Education has a positive and significant effect on financial literacy, while age and business turnover have a negative and significant effect. Gender has a positive but insignificant effect. The implications of this study emphasize the importance of improving access to financial education, particularly for older entrepreneurs and those with higher business turnover, to enhance their understanding of modern financial technology.



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## Introduction

The financial literacy index of Indonesian society increased from 38.03% in 2019 to 49.68% in 2022, according to a survey by the Financial Services Authority (OJK). Despite this increase, financial literacy remains relatively low (Rochendi et al., 2022). The 49.68% figure indicates that more than half of Indonesia's population still lacks the knowledge, skills, and confidence related to financial institutions, products, and services, including their risks and benefits.

Low financial literacy can have negative consequences for individuals, including MSMEs (Mas'adah & Astuti, 2022). They become vulnerable to fraud, such as illegal investments and online lending scams (Nurulhuda & Lutfiati, 2020; Rachmawati & Yudhawati, 2022; Saadah et al., 2022). From 2019 to 2021, there were 19,711 reported cases of illegal online loans filed by the public (Martini et al., 2023). Additionally, the CekRekening.id service from the Ministry of Communication and Information recorded approximately 480,000 reports related to electronic information and transaction crimes.

Among these, online transaction fraud dominated with 405,000 reports, while online trade-related fraud accounted for 12,000 cases. Generally, low financial literacy can also hinder the development of the financial sector (Filippova et al., 2016).

The high number of illegal online loan scams and online trading fraud, resulting from low financial literacy, is the main issue addressed in this study. MSMEs are particularly vulnerable to this risk, as their business activities are closely related to the types of scams that frequently occur. MSMEs often require loan financing, and due to limited knowledge, they may fall into the trap of illegal online loans with extremely high-interest rates, instead of utilizing official financial institutions as funding sources. MSMEs can also be deceived through online trade transactions, especially those involved in e-commerce or MSMEs 4.0.

Unlike conventional MSMEs that still rely on traditional business methods, MSMEs 4.0 refer to micro, small, and medium enterprises that adopt technology and digital innovation in their operations. This transformation enables MSME players to connect more effectively with consumers, optimize production processes, and expand market reach through various digital platforms. MSMEs transitioning to this business model utilize technologies such as e-commerce, social commerce, social media, business management applications, and big data to enhance efficiency and competitiveness. By leveraging digital platforms as marketing tools, MSMEs 4.0 have greater opportunities to reach broader markets. However, on the other hand, dependence on digital technology also increases vulnerability to cybercrimes, especially if MSME players lack adequate financial literacy to manage digital risks properly.

This study was conducted in Tebing Tinggi City, where financial literacy plays a crucial role in the sustainability of MSMEs, particularly in navigating the challenges of the digital economy. The urgency of this research is increasingly evident as there are still limited studies specifically analyzing the financial literacy levels of MSME players in this city. A previous study by Nasution et al. (2024) found that Islamic financial literacy among MSME players in Tebing Tinggi City remains relatively low. Although the study focused on Islamic financial literacy, its findings indicate a broader issue—namely, that the general level of financial literacy among MSME players still requires significant attention. Low financial literacy can lead to difficulties in financial management, including accessing and utilizing digital financial services effectively.

Moreover, most previous studies have not specifically examined MSME players who have adopted e-commerce and social commerce. In fact, MSMEs operating in the digital sphere face greater financial risks, such as illegal online loan fraud, unsafe online transactions, and a lack of understanding in managing digital finances. Therefore, this study offers a novel contribution by measuring the financial literacy index of MSMEs 4.0 in Tebing Tinggi City while also analyzing the key factors influencing financial literacy levels. By focusing on MSMEs that have transitioned to digital-based operations, this research aims to provide a more comprehensive understanding of financial literacy in the digital era, ultimately helping to formulate strategies for improving financial literacy among MSME players.

MSME owners who use e-commerce and social commerce must be well-literate to manage their business finances effectively and avoid becoming victims of online fraud. The vulnerability of MSMEs can hinder the development of MSMEs, which is a primary focus of the government, as outlined in the RPJMN 2020-2024. Low financial literacy has been shown to significantly affect MSME financial management (Pusporini, 2020). Financial literacy has a positive and significant correlation with MSME performance, meaning that low financial literacy can hinder MSME performance (Alamsyah, 2020; Romain et al., 2021; Yanti, 2019). Efforts to improve the financial literacy of MSMEs must begin with understanding the current state of SME financial literacy and thoroughly identifying the factors that influence it.

Study on financial literacy has been conducted in various regions across Indonesia. Pratama et al. (2022) investigated the factors influencing the financial literacy of MSME owners in Ternate City, finding that education, income, and savings behavior positively and significantly affect financial literacy. Christianty & Leasiwal (2022) conducted a similar study in Ambon, discovering that age, formal education level, and business turnover were key factors affecting financial literacy. Anisah & Crisnata (2021) analyzed the financial literacy levels of Fintech Payment OVO users in Mojokerto City and concluded that Paradoks Cafe and Roti John Like Kota Mojokerto demonstrated well-literate financial

literacy levels. Rohmayanti et al. (2021) examined the financial literacy of MSMEs in East Java, particularly in Sharia finance, finding that MSMEs had strong confidence in the Sharia financial literacy they practiced in their daily lives. Dewi (2021) found that the financial literacy level of MSMEs in Genteng District fell into the "sufficient literate" category (56.3%), with age and income having a significant effect on financial literacy, while education level, gender, and residential distance had no significant effect. Lastly, Suryandani & Tahwin (2020) analyzed the factors influencing the financial literacy of Batik Tulis Lasem MSMEs in Rembang Regency, concluding that gender, education level, and income had no effect on the financial literacy of Batik Tulis Lasem MSMEs.

This study examines the determinants of financial literacy, focusing on variables such as education level, age, business turnover, and gender. Education fundamentally provides a stronger knowledge base for understanding financial concepts. It can foster the skills needed to manage finances effectively. This aligns with the findings of Anggraini & Cholid (2022), which suggest that education level has a positive and significant impact on financial management ability. Therefore, MSMEs with a higher level of education tend to have a better understanding of various aspects of financial management, including cash management, budgeting, and financial planning. The mastery of basic financial concepts serves as a foundation for sharpening analytical skills, enabling SME owners to plan finances and conduct more thorough risk analyses. Awareness of various financial products and services, such as business credit, insurance, and fintech, also increases with higher education. Various financial instruments are utilized according to business needs, based on risk and benefit assessments of each option. From a behavioral perspective, education significantly contributes to a person's financial behavior (Andriyani & Sulistyowati, 2021; Kaiser & Menkhoff, 2017; Khovivah & Muniroh, 2023; Paramita et al., 2020; Suryantari & Patni, 2020). MSMEs with good education are generally more disciplined in recording cash flows, separating personal and business finances, and managing debt wisely. These attitudes and capabilities are the embodiment of characteristics of someone who is well-literate. Thus, it is clear that education has a positive effect on the financial literacy of MSMEs. This is supported by the research of Aziz (2020) and Margaretha & Sari (2015), which show that education has a positive and significant effect on financial literacy.

Another demographic variable influencing financial literacy is age. Age is closely related to the wealth of experience. Older MSME owners tend to have more experience managing business finances. This experience provides a deep understanding of financial risks, cash management strategies, investments, and business capital. Younger MSME owners, on the other hand, tend to lack deep understanding of these business aspects. From the perspective of openness to financial information and innovation, younger MSME owners are more open to financial technologies such as digital payment applications, fintech, and e-commerce platforms (Priyono, 2017). Conversely, older MSME owners tend to ignore financial technologies because they are more accustomed to conventional methods. Younger MSME owners are generally more willing to take business risks, whether in terms of investment or business expansion. Likewise, access to information and modern learning resources related to financial literacy tends to be better among younger MSME owners. The younger generation, accustomed to technology, can easily access financial literacy information, thereby improving their financial knowledge. They are also more receptive and adaptive to new financial technologies such as digital wallets, cloud-based accounting systems, and fintech services. In contrast, the older generation tends to struggle and take longer to accept and adapt to these financial technologies. Age is clearly closely related to financial literacy among MSMEs, influencing how they acquire financial information, openness to financial technology, and financial decision-making. Thus, age has a significant impact on financial literacy (Dewi, 2021; Margaretha & Sari, 2015; Prayogi & Haryono, 2017; Syuliswati, 2019).

Financial literacy can also be influenced by business turnover, which reflects the capacity and complexity of a business. In the MSME context, the larger the business turnover, the more complex the financial management. Thus, MSME owners with larger turnovers must master various financial management skills, such as cash flow management, investment planning, debt management, and the utilization of more diverse financial services to effectively manage business finances. In other words, the larger the MSME turnover, the deeper the need for financial literacy. At a larger business scale, MSME owners are required to understand financial statements in detail, make financial projections, and develop solid financial strategies to support business growth. Conversely, MSMEs with smaller turnovers may face limitations in access to financial education or training and financial technology,

resulting in lower financial literacy. Several studies have confirmed that business turnover has a significant effect on financial literacy (Arianti & Azzahra, 2020; Christianty & Leasiwal, 2022; Pratama et al., 2022).

In addition to business turnover, gender also has a significant correlation with financial literacy. In terms of financial decision-making, the gender aspect presents an intriguing picture, particularly due to the differences in financial knowledge and behavior between men and women. Research conducted by Wulandari & Deliabdila (2020) reveals disparities in risk-taking behavior based on gender. Men tend to exhibit greater willingness to confront risks compared to women, who are generally more cautious and inclined to avoid risk in financial decision-making (Utami & Kartini, 2017). Moreover, men are known to possess higher risk knowledge than women (Hirawati et al., 2021), which is likely a primary factor contributing to their bolder attitudes towards risk. Meanwhile, from a social perspective, men often find themselves in more advantageous positions, as women still face discrimination in some areas, which limits their access to equal opportunities. This discrimination can manifest as limitations in access to formal education (Sinaga et al., 2024; Zalukhu & Collyn, 2021), resources, and business networks. Such limitations directly impact women's knowledge regarding various complex issues, including financial knowledge. Consequently, this results in disparities in financial literacy between men and women.

Several studies have confirmed the existence of differences in financial literacy levels between men and women. Amaliyah & Witiastuti (2015) found that men tend to have higher financial literacy than women. However, other studies have found that women's financial literacy is higher than that of men (Arsanti & Riyadi, 2018; Nurulhuda & Lutfiati, 2020). This illustrates that gender has a close and complex relationship with financial literacy, where its influence may vary depending on social and economic contexts. This is supported by research conducted by Margaretha & Pambudhi (2015), Syuliswati (2019), Nurulhuda & Lutfiati (2020), and Wijayanti et al. (2016), which emphasizes that gender significantly affects financial literacy.

In the increasingly evolving digital era, where online fraud cases are on the rise, financial literacy becomes a crucial element for micro, small, and medium enterprises (MSMEs) in managing both business and personal finances. Lusardi (2019) even emphasizes that financial literacy should be viewed as a fundamental right and a universal necessity, rather than a privilege reserved for a select few with special access to financial knowledge or advice. Financial literacy is essential not only for the smooth operation of businesses but also serves as important protection for individuals against digital threats. Therefore, in-depth research on financial literacy is of utmost importance, prompting this study to be conducted. This study aims to analyze the financial literacy index of 4.0 MSMEs in Tebing Tinggi city and the determinants influencing it. The findings of this study are expected to provide insights into the financial literacy of MSMEs in Tebing Tinggi, while also serving as a foundation for formulating strategies to enhance financial literacy in the region. Thus, increasing financial literacy will contribute to the development of MSMEs as a robust foundation for the national economy.

## Method

This study is a quantitative research project with two main objectives: to measure the financial literacy index of micro, small, and medium enterprises (MSMEs) in Tebing Tinggi city, and subsequently to analyze the factors that most significantly influence this financial literacy index. The primary variable under investigation is financial literacy as the dependent variable, while the independent variables include education level, age, business turnover, and gender. This research focuses on 4.0 MSMEs in Tebing Tinggi city. The term "4.0 MSMEs" refers to MSMEs that have adopted digital technology to market their products, specifically through e-commerce and social commerce. According to the Satu Data Indonesia publication by Bappenas, the number of MSME actors in Tebing Tinggi city in 2021 reached 28,093 individuals. When calculated using Slovin's formula at a 10% significance level, the sample size for this study was determined to be 100 individuals. The sample was drawn using a multistage random sampling technique.

This study utilizes primary data sources. Data were obtained through questionnaires distributed to the research respondents. Respondents' perceptions regarding financial literacy were measured using



a Likert scale consisting of five categories: Strongly Agree (5), Agree (4), Disagree (3), Strongly Disagree (2), and Very Strongly Disagree (1). The collected data were subsequently analyzed using multiple linear regression analysis with the assistance of SPSS version 26.

The research process involved several stages of data analysis, starting with the measurement of the financial literacy index, followed by instrument testing, classical assumption testing, coefficient of determination testing, and finally, hypothesis testing. The measurement of the financial literacy index employed the provided questionnaire instruments. Subsequently, the financial literacy index was calculated using the criteria for the level of financial literacy.

The instrument testing for this research consists of validity and reliability tests. The validity test utilizes the product-moment correlation technique, while the reliability test employs Cronbach's Alpha. The classical assumption tests in this study include normality testing, multicollinearity testing, and heteroscedasticity testing. Normality testing is conducted using the Kolmogorov-Smirnov test. Data are considered normally distributed if the Asymp.Sig (2-tailed) probability > 0.05; conversely, if the Asymp.Sig (2-tailed) probability < 0.05, the data are deemed to have normality issues or to be not normally distributed. Multicollinearity issues are detected by examining the Tolerance value and the Variance Inflation Factor (VIF). A research model is considered free from multicollinearity issues if the tolerance value > 0.10 and the VIF < 10. Furthermore, heteroscedasticity testing in this study is conducted using the Glejser test. The model is stated to be free from heteroscedasticity issues if the significance probability of each variable in the regression results > 0.05. The hypothesis testing in this research employs partial significance testing (t-test). The decision-making process is based on the significance probability value. If the significance probability value is less than 0.05, the independent variable is declared to have a significant partial effect on the dependent variable, and vice versa.

This research model can be written as follows:  $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$ . Interpretation: Y = Financial literacy;  $X_1$  = Education level;  $X_2$  = Age;  $X_3$  = Business turnover;  $X_4$  = Gender; a = Constant;  $b_1$ - $b_4$  = Regression coefficients; e = Standard error.

**Table 1.** Measurement Indicators for Variables

Variable	Indicator	Scale
Financial Literacy	1. Knowledge of the value of goods and their priority ranking in life. 2. Managing money and saving money. 3. Monitoring credit. 4. Importance of risk management and insurance. 5. Knowledge of investments. 6. Preparing for old age. 7. Retirement planning. 8. Buying and comparing products. 9. Where to seek further advice and guidance as well as support information. 10. How to identify potential usage conflicts (priorities). (Asari et al., 2023)	Interval
Education level	Using dummy variables. Value 1 if the respondent has completed higher education, value 0 if not.	Ordinal
Age	Respondent's age at the time of completing the questionnaire (in years).	Interval
Business turnover	Total business income generated in one month (in Indonesian Rupiah).	Interval
Gender	Using dummy variables. Value 1 for male respondents, value 0 for female respondents.	Ordinal

## Results and Discussions

### Respondent Characteristics

The respondents in this study consist of 100 individuals who are 4.0 MSME actors in Tebing Tinggi city. The characteristics of the respondents can be described as Table 2.

**Tabel 2.** Karakteristik Responden

Characteristic	Description	Frequency	Percentage (%)
Highest Education	Higher Education	27	27
	Secondary Education	73	73
	Total	100	100
Age	18 years - 24 years	37	37
	25 years - 29 years	17	17
	30 years - 34 years	11	11
	35 years - 39 years	15	15
	≥ 40 years	20	20
	Total	100	100
Business Turnover	Rp 500.000 - Rp 5.000.0000	79	79
	>Rp. 5.000.000 - Rp. 10.000.000	15	15
	>Rp. 10.000.000 - Rp. 15.000.000	4	4
	>Rp 15.000.000	2	2
	Total	100	100
Gender	Male	23	23
	Female	77	77
	Total	100	100

Source: Processed Data (2024)

Table 2 presents the characteristics of the research respondents in terms of their highest education, age, business turnover, and gender. The majority of the respondents are MSME actors who completed secondary education, accounting for 73 percent, while those with higher education represent 27 percent. Most respondents fall within the age range of 18 to 24 years, comprising 37 percent, followed by those aged 40 years and above at 20 percent, those aged 25 to 29 years at 17 percent, those aged 35 to 39 years at 15 percent, and those aged 30 to 34 years at 11 percent. This indicates that the respondents are predominantly from Generation Z and the millennial generation, who are very familiar with information technology and digital platforms.

In terms of business turnover, the majority of respondents report a monthly turnover ranging from Rp 500,000 to Rp 5,000,000, with 79 percent falling within this interval. Seventeen percent of respondents have a monthly turnover exceeding Rp 5,000,000 but less than Rp 10,000,000. Four percent of respondents have a monthly turnover exceeding Rp 10,000,000 but less than Rp 15,000,000. Only 2 percent of respondents report a monthly turnover exceeding Rp 15,000,000. Regarding gender, the majority of the respondents are female, accounting for 77 percent, while male respondents comprise 23 percent.

### Ecommerce dan Social Commerce Preferences

This study aims to capture the e-commerce and social commerce platforms most favored by MSME actors in Tebing Tinggi city as marketing media for their products. Through a questionnaire, MSME actors were asked to identify the e-commerce and social commerce platforms they use. Some respondents utilize only one of these platforms, while others use both.

Table 3 presents the e-commerce and social commerce platforms most frequently used by the respondents. The most widely used e-commerce platform is Shopee, followed by Tokopedia, Lazada, Buka Lapak, and Grab Food. In contrast, the most frequently utilized social commerce platform is WhatsApp, followed by Facebook Shops, Instagram Shopping, TikTok Shop, and lastly, Line Shopping. Overall, 4.0 MSME actors in Tebing Tinggi city show a greater interest in utilizing social commerce compared to e-commerce as their marketing medium.

**Table 3.** E-commerce and Social Commerce Preferred by MSMEs in Tebing Tinggi city

Characteristic	Description	Frequency
E-commerce	Shopee	24
	Tokopedia	3
	Lazada	2
	Buka Lapak	2
	Grab Food	1
Social Commerce	TikTok Shop	12
	WhatsApp	76
	Facebook Shops	65
	Instagram Shopping	32
	Line Shopping	4

Source: Processed Data (2024)

**Financial Literacy Index of MSME Actors in Tebing Tinggi City**

A summary of the financial literacy index measurements for 4.0 MSME actors in Tebing Tinggi city is presented in Table 4.

**Table 4.** Financial Literacy Index of MSMEs in Tebing Tinggi City

Characteristic	Description	Financial Literacy Index (%)	Financial Literacy Level
Highest Education	Higher Education	85,59	High
	Secondary Education	81,03	High
Age	18 years - 24 years	84,32	High
	25 years - 29 years	83,38	High
	30 years - 34 years	81,29	High
	35 years - 39 years	82,22	High
	≥ 40 years	77,96	High
	Rp 500.000 - Rp 5.000.0000	83,04	High
Business Turnover	>Rp. 5.000.000 - Rp. 10.000.000	80,83	High
	>Rp. 10.000.000 - Rp. 15.000.000	77,50	High
	>Rp 15.000.000	71,67	High
	Male	84,06	High
Gender	Female	81,72	High
Overall Index		82,26	High

Source: Processed Data (2024)

Table 4 shows that the overall financial literacy index of MSME 4.0 actors in Tebing Tinggi city is high. The financial literacy index for MSME actors reaches 82.25 percent, which is above 70 percent, thus falling into the high category. A breakdown by respondent characteristics, including education level, age, business turnover, and gender, indicates that the financial literacy index for each group within these characteristics also exceeds 70 percent, categorizing them as high. In terms of education level, MSME actors who have completed higher education exhibit a financial literacy index of 85.59 percent, which is higher compared to those who have completed secondary education (81.03 percent). Although the difference is not significant, this condition highlights the substantial role of education in enhancing an individual's financial knowledge.

Regarding age, MSME actors in the 18 to 24-year age range demonstrate the highest financial literacy index (84.32 percent) compared to other age groups. MSME actors in this age range belong to Generation Z, characterized by their technological fluency. This advantage allows Generation Z to access a wealth of information, including that related to financial literacy. MSME actors aged 25 to 29 years (83.38 percent) rank second in this characteristic, followed by the 35 to 39-year age group (82.22 percent) and the 30 to 34-year age group (81.29 percent). These three age groups primarily comprise millennials, who are also technology-savvy, resulting in a financial literacy index that is not



significantly different from that of Generation Z. Conversely, MSME actors over the age of 40 possess the lowest financial literacy index (77.96 percent) among the other age groups. This group includes Generation X and Baby Boomers, who are less proficient in information technology. Consequently, their ability to access information related to financial literacy is quite limited. Additionally, Generation X's financial management behavior tends to be idealistic and conservative (Wahyuni et al., 2022), which hinders them from utilizing more innovative financial products and services, such as investments in fintech, cryptocurrencies, or technology-based financial instruments.

Regarding business turnover, MSME actors with monthly turnovers of Rp 500,000 to Rp 5,000,000 occupy the highest position (83.04 percent) among other turnover groups. This may occur because the majority of MSME actors in this turnover interval are Generation Z, who, as previously mentioned, exhibit the highest financial literacy index. These Generation Z actors are beginner entrepreneurs with relatively low monthly turnover but possess strong financial literacy skills to enhance their business financial management. Following this, MSME actors with a turnover of more than Rp 5,000,000 to Rp 10,000,000 hold the second position (80.83 percent), followed by those with a turnover of more than Rp 10,000,000 to Rp 15,000,000 (77.50 percent), and lastly, MSME actors with a monthly turnover exceeding Rp 15,000,000 have the lowest financial literacy index (71.67 percent). The differences in financial literacy indices are relatively significant, although they still fall within the high category. In terms of gender, male MSME actors have a higher financial literacy index (84.06 percent) compared to female MSME actors (81.72 percent). This finding aligns with the research conducted by Amaliyah and Witiastuti (2015), which reported similar results.

### Testing of Research Instruments

The testing of research instruments includes validity and reliability tests specifically for the financial literacy variable. A summary of the results of the validity and reliability tests is presented in Table 5.

**Table 5.** Summary of Validity and Reliability Test Results for Financial Literacy

Instrument Test	Statement	Pearson Correlation	Sig. (2-tailed)	Note
Validity Test	1	0,367	0,000	Valid
	2	0,505	0,000	Valid
	3	0,492	0,000	Valid
	4	0,530	0,000	Valid
	5	0,556	0,000	Valid
	6	0,682	0,000	Valid
	7	0,673	0,000	Valid
	8	0,691	0,000	Valid
	9	0,810	0,000	Valid
	10	0,773	0,000	Valid
	11	0,727	0,000	Valid
	12	0,734	0,000	Valid
	13	0,720	0,000	Valid
	14	0,533	0,000	Valid
	15	0,610	0,000	Valid
	16	0,649	0,000	Valid
	17	0,555	0,000	Valid
	18	0,507	0,000	Valid
	19	0,618	0,000	Valid
	20	0,564	0,000	Valid
	21	0,681	0,000	Valid
	22	0,620	0,000	Valid
	23	0,646	0,000	Valid
	24	0,571	0,000	Valid
Reliability Test	Cronbach' s Alpha Value		0,930	Reliable

Source: Processed Data (2024)

Table 5 indicates that the research instruments used in this study are both valid and reliable. The results of the validity test show that the Sig. (2-tailed) values for all instrument items are less than 0.05, with positive Pearson correlation values. This indicates that the research instruments are valid. Similarly, the reliability test results show a Cronbach's Alpha value greater than 0.6, allowing us to conclude that the research instruments are reliable.

### Classical Assumption Testing

The classical assumption testing in this study includes normality tests, multicollinearity tests, and heteroskedasticity tests. The normality test was conducted using the Kolmogorov-Smirnov Test, the multicollinearity test utilized tolerance values and the Variance Inflation Factor (VIF), and the heteroskedasticity test employed the Glejser test.

**Table 6.** Summary of Normality Test Results

	Unstandardized Residual
N	100
Asymp. Sig. (2-tailed)	0,101

Source: Processed Data (2024)

The results of the normality test presented in Table 6 indicate that the research model does not suffer from data normality issues. The Asymp. Sig. (2-tailed) value is 0.101, which is greater than the alpha value of 0.05. This suggests that the research data follows a normal distribution.

**Table 7.** Summary of Multicollinearity Test Results

Variable	Tolerance	VIF	Note
Education Level	0,997	1,003	No multicollinearity
Age	0,960	1,042	No multicollinearity
Business Turnover	0,933	1,071	No multicollinearity
Gender	0,967	1,034	No multicollinearity

Source: Processed Data (2024)

The multicollinearity test results presented in Table 7 indicate that the research model does not experience multicollinearity issues. It can be observed that the tolerance values for all independent variables are greater than 0.1, and the VIF values for all independent variables are less than 10. This indicates that there are no high correlations among the independent variables in the research model.

**Table 8.** Summary of Heteroskedasticity Test Results

Variable	Sig	Note
Education Level	0,345	No heteroskedasticity
Age	0,511	No heteroskedasticity
Business Turnover	0,649	No heteroskedasticity
Gender	0,186	No heteroskedasticity

Source: Processed Data (2024)

The heteroskedasticity test results presented in Table 8 show that the research model does not suffer from heteroskedasticity issues. This is reflected in the significance probability values for all independent variables being greater than 0.05, thus indicating that the research model can be considered free from heteroskedasticity issues.

### Determination Coefficient Testing

The determination coefficient indicates the extent to which the independent variables explain the variation in the dependent variable. In this study, the determination coefficient is reflected in the Adjusted R Square value. A higher Adjusted R Squared value signifies a greater ability of the independent variables to explain the variation in the dependent variable.

**Table 9.** Summary of Determination Coefficient Test Results

R Square	Adjusted R Squared
0,211	0,178

Source: Processed Data (2024)

Based on Table 9, the Adjusted R Squared value is 0.178. When interpreted, this value indicates that the variables of education level, age, Business Turnover, and gender explain only 17.8% of the variation in financial literacy, while the remaining 82.2% is explained by other variables not included in the research model.

### Hypothesis Testing

A summary of the multiple linear regression analysis results is presented in Table 10. From Table 10, the regression coefficient for the education level variable is 5.635, with a significance probability value of 0.008. This significance probability value is less than the alpha level (0.05), indicating that education level has a positive and significant impact on the financial literacy of 4.0 MSME actors in Tebing Tinggi city.

**Table 10.** Summary of Multiple Linear Regression Analysis Results

Variable	Regression coefficients	Prob.
Education Level	5,635	0,008
Age	-0,235	0,008
Business Turnover	-2,715	0,013
Gender	3,438	0,125
F-statistic		6,366
Prob(F-statistic)		0,000

Source: Processed Data (2024)

Conversely, age has a negative and significant effect on financial literacy, as reflected in the negative regression coefficient of the age variable (-0.235), with a significance probability value less than the alpha level ( $0.008 < 0.05$ ). Similarly, Business Turnover also negatively and significantly impacts financial literacy, with a negative regression coefficient and a significance probability value less than the alpha level ( $0.013 < 0.05$ ).

The gender variable has a regression coefficient of 3.438, indicating a positive relationship between gender and financial literacy. However, the significance probability value for the gender variable is greater than the alpha level ( $0.125 > 0.05$ ), leading to the conclusion that gender positively influences financial literacy but is not significant for 4.0 MSME actors in Tebing Tinggi city.

Education level, age, and Business Turnover are determinants of financial literacy for 4.0 MSME actors in Tebing Tinggi city. These three variables have a significant influence on financial literacy, while gender does not serve as a determinant because its influence is not significant. An increase in education level has a significant impact on enhancing financial literacy; specifically, if the education level rises by one level, financial literacy will also increase by 5.635 percent. Likewise, both gender and Business Turnover significantly affect financial literacy, albeit in an inverse relationship.

### The Impact of Education Level on Financial Literacy

The analysis results indicate that education level has a positive and significant impact on the financial literacy of 4.0 MSME actors in Tebing Tinggi city. This implies that an increase in education level plays a crucial role in enhancing the financial literacy of MSME actors. These findings align with the research conducted by Aziz (2020) and Margaretha & Sari (2015). This study suggests that as the education level of business actors increases, their ability to understand and manage the financial aspects of their business also improves. A deeper understanding of financial management is derived from the extensive experiences gained during their educational journey. This experience equips MSME actors with better critical and analytical thinking skills, enabling them to analyze the benefits and risks associated with financial institution products.

Moreover, MSME actors with higher education levels can access and utilize financial information more effectively, allowing them to make more rational and targeted financial decisions. This research underscores the vital role of education in promoting financial literacy among the community, particularly for MSME actors. It is essential for these actors to be equipped with relevant and up-to-date financial knowledge to effectively navigate the dynamics of digital technological advancements. Digital technology has significantly transformed the products and services offered by financial institutions, as well as the manner in which these products are utilized. This transformation is rapid and continuously evolving.

Therefore, it is crucial for MSME actors to receive adequate financial literacy education to keep pace with these developments and avoid the risks of digital technology misuse. The government and related institutions should strengthen financial education programs, both through formal and non-formal training, accessible to business actors from diverse educational backgrounds. Consequently, an increase in education will not only result in improved financial literacy but also enhance the capacity of MSME actors to manage their businesses more efficiently and sustainably.

### **The Impact of Age on Financial Literacy**

The analysis results indicate that age has a negative and significant impact on the financial literacy of 4.0 MSME actors in Tebing Tinggi city. These findings are consistent with the research conducted by Prayogi & Haryono (2017) and Zalukhu et al. (2024). This study suggests that as the age of MSME actors increases, their level of financial literacy tends to decline. The rapid advancement of information technology has transformed various aspects of financial management, resulting in older individuals struggling to master modern financial technologies.

Additionally, older MSME actors often face limitations in accessing more modern financial information. They tend to encounter difficulties in keeping pace with the developments in digital financial technologies, such as financial management applications or electronic payment systems, which are crucial elements of financial literacy in the 4.0 era.

Moreover, older MSME actors are likely to experience constraints in updating their knowledge regarding the latest financial concepts or more complex financial instruments. Their financial management behavior is often conservative (Wahyuni et al., 2022), making them less receptive to new financial opportunities, which affects their ability to make sound and efficient financial decisions. A lack of exposure to financial literacy education in their youth further contributes to the lower financial literacy observed in the older age group. Consequently, advancing age tends to act as a barrier to improving financial literacy, particularly in the context of rapidly evolving financial technologies.

### **The Impact of Business Turnover on Financial Literacy**

The analysis results indicate that business turnover has a negative and significant impact on the financial literacy of micro, small, and medium enterprises (MSMEs) 4.0 in Tebing Tinggi city. These findings align with prior research suggesting that as business turnover increases, the financial literacy of MSME owners tends to decline. One possible explanation for this phenomenon is that MSME owners with higher turnover levels often prioritize operational aspects of their businesses and revenue growth, thereby neglecting the importance of enhancing their knowledge and understanding of financial literacy. In such situations, they may rely more on external assistance from financial consultants or accountants to manage their business finances.

Moreover, MSME owners with greater turnover may feel less motivated to improve their financial literacy because they perceive themselves to have attained a certain level of financial success. This heightened self-confidence in their business capabilities can lead them to overlook the necessity for a deeper understanding of financial management, financial risks, and the use of more sophisticated financial technologies. Consequently, this may result in a lack of awareness regarding rapidly evolving financial innovations in the digital age, which could otherwise enhance the efficiency and effectiveness of their financial management practices. Therefore, these findings suggest that MSME owners with higher turnover often exhibit lower financial literacy compared to those with smaller turnover levels.

### **The Impact of Gender on Financial Literacy**

The analysis results indicate that gender has a positive but insignificant effect on the financial literacy of micro, small, and medium enterprises (MSMEs) 4.0 in Tebing Tinggi city. This finding is consistent with previous research. It suggests that although men tend to exhibit slightly higher levels of financial literacy compared to women, the difference is not substantial enough to be statistically significant.

Initial assumptions that gender is significantly related to financial literacy—due to various factors such as differences in financial knowledge and behavior between men and women, as well as limited access for women due to specific discrimination that enhances the financial literacy of men—have not been substantiated. This research does not support such arguments. One reason for the lack of significant impact of gender on financial literacy may be that access to financial information, education, and experience in managing businesses is relatively similar between men and women in the context

of MSMEs in Tebing Tinggi city. Both men and women have relatively equal opportunities to access digital technology and financial information in the 4.0 era, resulting in a diminished gender gap in financial literacy. This also reflects the notion that other factors, such as education and business experience, may play a more dominant role in determining financial literacy levels compared to gender itself.

## Conclusions

This study aims to analyze the financial literacy index of micro, small, and medium enterprises (MSMEs) 4.0 in Tebing Tinggi city and the determinants affecting it. Based on the analysis results, it can be concluded that the financial literacy index of MSMEs 4.0 in Tebing Tinggi city is classified as high, reaching 82.26 percent. Education was found to have a positive and significant impact on the financial literacy of MSMEs 4.0 in Tebing Tinggi city. Conversely, age and business turnover have a negative and significant impact on the financial literacy of MSMEs 4.0 in Tebing Tinggi city. Gender, on the other hand, has a positive but insignificant effect on the financial literacy of MSMEs 4.0 in Tebing Tinggi city. The determinants of financial literacy for MSMEs 4.0 in Tebing Tinggi city include education level, age, and business turnover.

The findings of this study contribute to a deeper understanding of the financial literacy levels of MSMEs 4.0 in Tebing Tinggi city and the factors influencing it. The implications of this study emphasize the importance of improving access to financial education, particularly for older entrepreneurs and those with higher business turnover, to enhance their understanding of modern financial technology. The finding that education has a positive and significant effect suggests that financial literacy improvement programs should focus on both formal education and skill-based financial training. Meanwhile, the negative impact of age and business turnover indicates a need for special attention for older business owners and those with higher turnover, who tend to be less exposed to modern financial concepts and technologies. Appropriate interventions, such as digital financial technology training and application-based financial management, can help enhance financial literacy among older MSME owners and those with higher turnover, allowing them to manage their business finances more efficiently in the digital era. These considerations can serve as a basis for formulating policies aimed at improving financial literacy among MSMEs in Tebing Tinggi city and other regions in Indonesia.

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