

Unlocking Financial Literacy in Generation Z: Are Sociodemographic Factors the Key?

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Abstract

This research aims to investigate the relationship between sociodemographic factors, encompassing age, gender, and access to the internet among Generation Z in Surabaya, utilizing the convergence theory framework. Convergence theory posits that both heredity and environmental factors can affect human development. There are 441 respondents employed as the sample of this research. We use multiple regression linear analysis to examine the hypothesis. The finding reveals that age and gender positively affect financial literacy, whereas access to the internet does not directly affect financial literacy. Instead, it exerts an indirect effect through financial interest. Various robustness tests were conducted, and the results remained consistent.

Keywords: access to the internet, age, financial literacy, gender.

1. Introduction

Financial literacy is a crucial life skill in today's complicated economy. It equips individuals with financial concepts and risk knowledge to create effective decisions in several financial contexts (Ansari et al., 2023). Financial literacy becomes more critical as personal financial responsibilities increase due to the more sophisticated financial products. Lusardi and Mitchell (2014) observe that people with lower financial literacy tend to make uninformed financial decisions, especially during the financial crisis. Meanwhile, people with financial literacy can make a good money plan, avoid debt, and ensure their financial well-being by saving for retirement (Siegfried & Wuttke, 2021).

Indonesia's Financial Services Authority released the Financial Literacy National Survey in 2022 and showed that the financial literacy rate in Indonesia is 49.68%. It represents an increase from 2019 by 38.03%. However, this number is far below the financial inclusion rate of 85.10%. Therefore, Indonesia aims to increase the financial literacy rate to 65% to minimize the gap and align with other countries. The survey also indicated that Generation Z has the lowest financial literacy compared to other generations. It was 3.94% lower than millennials (Laturette et al., 2021). However, data from the Central Statistical Bureau revealed that Generation Z constitutes the most significant portion of Indonesia's population, at 27.94% (Anjani & Darto, 2023; Bureau, 2023).

Generation Z refers to the second-youngest generation, born between 1997 and 2012, with

millennials preceding them and the alpha generation following them. Most of this generation is financially vulnerable (Hong Shan et al., 2023). Generation Z has a strong desire to enjoy experiences. This desire leads them to spendthrift consumption patterns. Furthermore, based on research conducted by the IDN Research Institute, Generation Z only allocates around 10% of their income to savings. Additionally, reports from the Financial Services Authority indicate that Generation Z and millennials receive the most significant portion of online credit loans in Indonesia. These facts strengthen the need to enhance financial literacy among Generation Z.

To increase financial literacy among Generation Z, it is essential to understand the factors that affect a person's financial knowledge and decision-making. Previous literature demonstrates that socio-demographic factors affect financial literacy (Irman et al., 2020; Lotto, 2020). Siegfried and Wuttke (2021) asserted that several groups of people, based on socio-demographic factors, tend to perform better. Nonetheless, the preceding findings present a lack of consistency. Understanding factors that affect the financial literacy of Generation Z is essential since they are the future generation that will significantly affect our economy in the long run, and equipping them with financial knowledge will be beneficial for their well-being, future financial behavior, future business and economy of the country (Edwy et al., 2022).

Okamoto and Komamura (2021) and Pratama and Selvia (2021) found that greater age can increase financial literacy. However, Irman et al. (2020) and Dewanty and Isbanah (2018) showed that age does not affect financial literacy. Irman et al. (2020) also

concluded that gender does not affect financial literacy. In contrast, Okamoto and Komamura (2021) proved that males have higher financial literacy than women, while Pratama and Selvia (2021) observed the opposite result. Saharan et al. (2023) assessed the antecedent of financial literacy and found that internet access is the top-ranked antecedent. Meanwhile, to our knowledge, several previous studies have not examined the relationship between access to the Internet and financial literacy.

Building on the previously explained phenomena and addressing research inconsistencies, our research question is: *What sociodemographic factors can increase the financial literacy of Generation Z in Surabaya?* This study aims to bridge the previous research gap by providing empirical evidence of what sociodemographic factors can affect the financial literacy of Generation Z in Surabaya. The sociodemographic factors examined are limited to gender, age, and access to internet connection. This research also focuses on how access to an internet connection can increase financial literacy, which previous studies have not facilitated. We will analyze this using the convergence theory framework, which posits that both heredity and environmental factors can affect human development. We employed multiple regression linear analysis to analyze the data. Moreover, instead of using a Likert scale to measure financial literacy, we test the respondents using ten basic financial questions. This finding significantly contributes to the field of finance and daily life. The result of this study can help financial planners, governments, and financial institutions design more effective financial education programs that have been adjusted to a specific population characteristic.

2. Literature Review

2.1. Convergence Theory

Convergence theory states that both heredity or innate and environmental factors influence human development equally (Ulfiani et al., 2022). William Stern pioneered this theory. It synthesizes nativist and empiricist theories (Saputra et al., 2023). Heredity is the tendency of an individual to grow and develop based on specific characteristics and traits. Growth pertains to physical characteristics such as gender, hair type, and body parts, whereas development refers to personality traits like intelligence, patience, and compassion. Heredity is derived from the genes that the individual's parents pass down.

However, every individual lives in an environment and cannot be separated from it. This means that

environmental factors, not just heredity, influence an individual's development. Someone with the same ancestry but living in a different environment may develop differently. As a result, the interaction between heredity and the environment determines the state of development of specific elements within an individual.

Financial literacy is effectively understanding and managing one's finances (Hendarto et al., 2021). Financial literacy is not a skill learned from birth but develops as people grow and gain experience (Lusardi & Messy, 2023). This ability is not inherited but developed through education, interactions with the environment, and personal experiences throughout one's life.

Individuals learn about finances in various ways, including formal education in school, parental and family influence, and personal experiences in managing their own money. They may make financial mistakes, face various financial situations, and learn from those experiences. Therefore, financial literacy is the result of personal development and lifelong learning, and this ability can continually improve over time as one gains more knowledge and experience managing finances.

Sociodemographic characteristics, which include factors like age, gender, and social background, play a significant role in the context of convergence theory. According to this theory, these sociodemographic factors may impact how people within society develop, adapt, and come together in their values, traits, and behavior (Amari et al., 2020). The theory recognizes that people from similar sociodemographic groups may have similar experiences, challenges, and opportunities, which could result in similar behaviors and beliefs. In the context of financial literacy and convergence theory, people with similar sociodemographic traits may tend to have similar levels of financial literacy (Zulfiqar & Bilal, 2016).

2.2. Age and Financial Literacy

As people get older, they experience psychological changes. People tend to have better thinking skills as they mature and grow older. The convergence theory says that genetics and the environment can affect how someone develops their abilities. This implies that more mature thinking skills will influence their ability to understand financial concepts. Older people will find it easier to understand and apply basic money concepts (Pratama & Selvia, 2021). They are more likely to consider the future, understand financial risks better, recognize the importance of long-term financial planning, and be more aware of their financial stability.

Older people must also deal with various financial situations directly, such as purchasing a house, investing, or planning for retirement. This compels them to learn and understand more about money. As a result, more mature people typically have better financial literacy. Previous research has also found that younger people encounter more formidable obstacles in understanding and effectively managing financial principles and procedures (Fong et al., 2021; Okamoto & Komamura, 2021; Ruiz-Palomo et al., 2023). Given this context, we now propose the following hypothesis:

H₁: The higher the age is, the greater their level of financial literacy becomes.

2.3. Gender and Financial Literacy

Male and female individuals have different characteristics (Fatimah et al., 2019). They differ due to the genetic combination and hormonal factors (Szadvári et al., 2023). Based on convergence theory, the different characteristics between males and females may lead to different financial literacy rates. Males are risk-takers, whereas females are risk-averse. As a result, males are more confident in making financial decisions than females (Bayar et al., 2020; Nurhadi & Hidayat, 2021). This is evident in the participation in stock market investment, where most participants are male (Van Rooij et al., 2011).

Several previous studies by Nurhadi and Hidayat (2021) and Gudjonsson et al. (2022) also demonstrated that females are less interested in learning finance. Afandy et al. (2020) asserted that females are less interested in learning about investment and personal finance topics, which causes them to use financial services less frequently. Moreover, males are more capable of setting personal financial goals and assessing future financial performance than females. Taking into account the background, our proposed hypothesis is:

H₂: Males possess a higher level of financial literacy than females.

2.4. Access to Internet and Financial Literacy

Access to the internet allows individuals to access abundant information, including financial data. The Internet offers access to various resources, such as financial education, the latest investment products, and financial instruments. Consequently, individuals may quickly learn about financial subjects like debt management, investments, retirement planning, and budgeting. With sufficient internet

access, individuals can acquire the essential knowledge to facilitate wiser financial decision-making. In the context of the convergence theory, the internet is an environmental factor that can significantly influence an individual's level of financial literacy. Saharan et al. (2023) evaluated the antecedents of financial literacy among young adults using the best-worst method and discovered that internet access was the top-ranked antecedent of financial literacy. Against this background, we propose the following hypothesis:

H₃: The greater an individual's access to the internet, the higher their financial literacy tends to be.

3. Methods

This study employs a quantitative research method to investigate the relationship between age, gender, and access to the internet toward the financial literacy of Generation Z individuals in Surabaya. The population of this study consists of people born between 1997 and 2012 in Surabaya. According to the latest Central Bureau of Statistics report, the population totals 711,730 people (Statistik, 2023). Hence, the required sample size calculated using the Slovin formula with a 5% significance error is 400 respondents. However, the final sample size of our study is 441 respondents. The respondents were chosen via simple random sampling. We collect the data using an online survey, namely Google Forms. The dependent variable in this study is financial literacy (FLIT). The FLIT value is the number of correct answers provided by the respondents. The questionnaire has ten financial literacy questions, and they cannot search from any sources to answer them. The questions cover basic personal finance and investment and are presented in a multiple-choice format. Several questions are adopted from Van Rooij et al. (2011) with several modifications. Each number has one correct answer, and each correct answer is assigned a value of 1 point. Therefore, the FLIT score ranges from 0 to 10. Table 1 provides a list of financial literacy questions. The independent variable is sociodemographic factors that consist of age (AGE), gender (GEN), and access to the internet (ATI). These data were obtained from the background questions. Age is a numerical variable, while both gender and access to the internet are binary variables. For gender, a code of 1 is assigned to male respondents and 0 to female respondents. In the case of access to the internet, a code of 1 is given if the respondent has good internet access, while 0 is not.

Table 1. Financial literacy questions

Basic Financial Literacy Questions	
1. <i>Emergency fund</i> : An emergency fund must be established before insurance and investments.	A. True B. False C. Do not know
2. <i>Insurance</i> : The main goal of having insurance is ...	A. Investment B. Protecting oneself from losses due to potential risks C. Eliminating risk D. Do not know
3. <i>Investment Concept</i> : When an investor spreads his money among different assets, does the risk of losing money increase?	A. Increase B. Decrease C. Do not know
4. <i>Financial Technology</i> : Which is not an example of digital payment in Indonesia?	A. Internet banking B. QRIS C. Credit card D. Do not know
5. <i>Macroeconomics</i> : Inflation will make your purchasing power ...	A. increases B. decreases C. not change D. do not know
Investment and Financial Instrument Questions	
6. Investing in mutual funds is safer than investing in stocks	A. True B. False C. Do not know
7. Investing in stocks is safer compared to investing in peer-to-peer lending	A. True B. False C. Do not know
8. Which statement is correct if somebody buys the stocks of firm B in the stock market?	A. He owns a part of firm B B. He has lent money to firm B C. He is liable for firm B's debt D. Do not know
9. What happens if somebody buys a bond from firm B?	A. He owns a part of firm B B. He has lent money to firm B C. He is liable for firm B's debt D. Do not know
10. Which one is correct about peer-to-peer landing?	A. Investors lend money directly to the borrowers. B. Borrowers pay higher interest than the interest received by the investors C. There is no risk of default D. Do not know

Source: Van Rooij et al. (2011) with author's modification
Note: Bold formatting represents the correct answer

After collecting the data, it is processed using Stata. The analysis method used is multiple linear regression analysis. The regression model to test the hypothesis, $FLIT = \alpha + \beta_1 AGE + \beta_2 GEN + \beta_3 ATI + \epsilon$ (1)

Meanwhile, before conducting regression analysis, we perform classical assumption tests: normality, heteroskedasticity, and multicollinearity to ensure that the estimation results are accurate and unbiased.

4. Result

4.1. Descriptive Statistics

Table 2. Descriptive statistics

Variable	Mean	Median	Std. Deviation	Max.	Min.
FLIT	5.803	6	2.061	0	10
AGE	18.483	18	2.697	12	26
GEN	0.553	1	0.498	0	1
ATI	0.891	1	0.312	0	1

Table 2 demonstrates the descriptive statistics of variables used in this study. The value of the mean (median) of financial literacy is 5.803 (6). It shows that the respondents can answer approximately 5 or 6 correct answers out of 10 questions. Moreover, FLIT's minimum (maximum) value is 0 (10). It indicates that respondents are highly diverse; some have excellent financial literacy, while others have none.

Table 3. Sample distribution based on age, gender, and access to the internet

Age		
Age	Proportion	Number
12 – 17	19.73%	87
18 – 21	66.67%	294
22 – 26	13.61%	60
Gender		
Gender	Proportion	Number
Male	55.33%	244
Female	44.67%	197
Access to Internet		
Access to Internet	Proportion	Number
Good	89.12%	393
Not good/not have	10.88%	48

Respondents' average (median) age is 18.483 (18) years. The age of respondents varies between 12 and 26 years old since our sample is Generation Z. More than half of our respondents are male, as indicated by the average and median gender variables. The average and median of gender variables are 0.553 and 1, consecutively. The majority of the

samples have good access to the internet, as reflected in the average (median) score of 0.891 (1) for access to the internet.

Table 3 provides the sample distribution based on age, gender, and access to the Internet. The table indicates that 19.73% of the respondents are in the high school age group (12-17 years old), 66.67% are in the university-level age group (18-21 years old), and the remaining 13.61% are in the 22-26 years old category. Regarding gender, 55.33% of the sample are male, and the remaining 44.67% are female. Furthermore, 89.12% of the sample have a good internet connection, and the rest, 10.88%, do not.

4.2. Hypothesis Testing

We conduct classical assumption tests prior to conducting regression analysis. The result shows that our data is free of normality and multicollinearity issues. Meanwhile, the data suffers heteroskedasticity. Hence, we will employ robust standard error to address heteroscedasticity (Mansournia et al., 2021). We do not conduct autocorrelation tests as the data is not time series.

Table 4 presents the regression analysis result. In panel 1, we display the result of regression analysis of equation (1). Subsequently, we divide the financial literacy questions into two categories: 5 questions comprising basic financial literacy questions and five with investment literacy questions. We conduct separate regression analyses for each basic financial literacy (BFL) and investment literacy (IL) and provide the result in Table 4, panel 2, and panel 3.

The results show that age positively affects financial literacy, including basic financial and investment literacy, at the 1% significance level. The result shows that people have better financial literacy as they age. Therefore, H₁ is accepted. This result aligns with the previous studies conducted by Okamoto and Komamura (2021) and Pratama and Selvia (2021). The effect of gender on financial literacy, including both BFL and IL, is also significant at a 1% level. The positive coefficient implies that males have better financial literacy than females. This finding exhibits that males have higher financial literacy than females. This result is consistent with previous research conducted by Afandy et al. (2020) and Okamoto and Komamura (2021). Hence, H₂ is also accepted.

Furthermore, the result indicates that access to the Internet does not affect financial literacy. However, Table 4, panel 3 shows that access to the Internet affects investment literacy (IL) at a 10% significance level. It indicates only a tiny effect on investment literacy. Therefore, we reject H₃, suggesting

that higher internet access does not necessarily lead to higher financial literacy.

Table 4. Regression analysis result

Variables	Panel 1	Panel 2	Panel 3
AGE	0.2440 (6.8000) ^{***}	0.1626 (7.4500) ^{***}	0.0814 (3.6400) ^{***}
GENDER	0.6423 (3.3000) ^{***}	0.2991 (2.6400) ^{***}	0.3432 (2.8200) ^{***}
ATI	-0.1947 (-0.6300)	0.1826 (0.9800)	-0.3772 (-1.7900) [*]
Constant	1.1107 (1.4600)	0.4019 (0.9200)	0.7089 (1.4000)
Adjusted R-square	13.41%	15.39%	6.30%
F-value	18.72 ^{***}	22.85 ^{***}	9.37 ^{***}
N	441	441	441

Notes: Robust t-statistics are in brackets based on robust standard errors clustered by firm. ^{***}, ^{**}, and ^{*} indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

4.3. Additional Tests

Table 5. Additional test

Variables	Dependent: FINT	Dependent: FL
AGE	0.0037 (0.30)	0.2430 (6.78) ^{***}
GEN	0.4726 (7.08) ^{***}	0.5135 (2.81) ^{***}
ATI	0.3619 (3.67) ^{***}	-0.2934 (-1.00)
FINT		0.2727 (1.92) ^{***}
Constant	1.8717 (7.55) ^{***}	0.6003 (0.70)
Adjusted R-square	10.53%	13.48%
F-value	18.14 ^{***}	14.13 ^{***}
N	441	441

Notes: Robust t-statistics are in brackets based on robust standard errors clustered by firm. ^{***}, ^{**}, and ^{*} indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

We attempt to conduct additional tests by examining the effect of financial interest as an intervening variable in the relationship between access to the Internet and financial literacy. We asked the same respondents yes or no questions regarding their interest in finance. Hence, the financial interest variable (FINT) I the respondent has a financial interest, and 0 is if not. The regression equation is a simultaneous equation, as follows

$$\begin{aligned}
 FINT &= \alpha + \beta_1 AGE + \beta_2 GEN + \\
 \beta_3 ATI + \varepsilon_1 & \\
 FL &= \alpha + \beta_1 FINT + \beta_2 AGE + \beta_3 GEN + \\
 \beta_4 ATI + \varepsilon & \quad (3)
 \end{aligned}$$

4.4. Robustness Test

We conducted several robustness tests to examine whether the result is robust to changes in model specification. First, we changed the measurement of age using dummy variables. We categorize the age into three categories: high school age (12-17 years old), university age (18-21 years old), and after-university age (22-26 years old). We assigned the code 1 for high school age, 2 for university age, and 3 for after university age. The result is portrayed in Table 6, panel 1, and is consistent with the previous finding. Second, we added several control variables that can affect financial literacy. The control variables added are monthly income (INCO) and education (EDU) (Wagner, 2019). Monthly income and education are dummy variables, in which a higher dummy value indicates higher income and education. The result has been provided in Table 6, panel 2, and is not different from the previous finding.

Table 6. Robustness test

Variables	Panel 1	Panel 2
AGE	1.4338 (6.94) ^{***}	1.1623 (4.06) ^{***}
GEN	0.6743 (3.46) ^{***}	0.6926 (3.54) ^{***}
ATI	-0.2497 (-0.80)	-0.1822 (-0.59)
INCO		0.2804 (2.29) ^{**}
EDU		-0.1590 (-1.07)
Constant	2.7163 (4.96) ^{***}	3.3039 (2.92) ^{***}
Adjusted R-square	13.99%	15.21%
F-value	20.30 ^{***}	15.38 ^{***}
N	441	441

Notes: Robust t-statistics are in brackets based on robust standard errors clustered by firm. ^{***}, ^{**}, and ^{*} indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

5. Discussion

The finding indicates that people with higher age will have better financial literacy. More mature people are likely to have a better ability to understand financial concepts. Since our sample is Generation Z, it reveals that students of school age still do not possess good financial literacy. As people grow older, they need to make more significant financial decisions for their own lives (Eberhardt et al., 2019). After individuals reach the age of 21, they will start to work and earn money by themselves. At this point, they must understand how to manage their

finances to fulfill their daily needs and prepare for long-term financial goals. Therefore, they learn about finance indirectly through their daily experiences (Fong et al., 2021). Moreover, people of higher age can quickly gather financial information for learning purposes.

Males also prove to possess higher financial literacy than females. Males must be different from females in terms of genetic factors. This finding strengthens convergence theory, stating that both heredity and environmental factors will affect human development. Several arguments may explain this phenomenon. First, males are more likely to be more confident in taking higher financial risks, which causes them to be more brave in taking riskier financial instruments (Afandy et al., 2020). Second, Tinghög et al. (2021) found the stereotype that finance is the masculine domain. Therefore, the male is trusted more to handle finance than the female. Third, females are less interested in learning finance than males (Gudjonsson et al., 2022). Çera and Tuzi (2019) analyzed young males' and young females' behavior. Their finding confirmed that young males were more willing to take financial action and learn about finance.

The other finding is that access to the Internet does not affect financial literacy. However, previous research conducted by Saharan et al. (2023) shows that access to the Internet is the top antecedent of financial literacy. This discrepancy may happen because people may not utilize the internet effectively to learn finance. One possible reason for this could be a lack of financial interest. Table 5 presents the result of this additional test. It indicates that access to the internet positively affects financial interest, and financial interest also affects financial literacy at a 1% level. We employed the Sobel test to confirm the indirect effect (Yusup et al., 2022). The t-statistics of the Sobel Test is 1.6989, demonstrating that indirect effect occurs at a 10% significance level. Therefore, access to the internet has an indirect effect on financial literacy through financial interest. The result is consistent with convergence theory, showing that environmental factors can affect human development through indirect effects.

The findings have several implications and contribution for finance theory, individuals, government, and institutions. This research provides additional insights into factors influencing the financial literacy of Generation Z. Given the low level of Generation Z's financial literacy, several parties can focus on specific demographics to improve financial literacy. Institutions and governments can provide more financial education for high school students. Adding several financial extracurriculars or incorporating finance topics

into lessons can help increase financial literacy. In addition, institutions and governments could give opportunities for female females to participate in financial decision-making and offer various financial training activities to motivate them to understand finance. Internet access should not be a problem since most respondents have good Internet access. Nevertheless, institutions and governments can create strategies to increase people's financial interests so that internet access resources can enhance financial literacy.

However, this research has several limitations. First, this research solely focuses on Generation Z in Surabaya as the sample since Indonesia's Financial Services Authority data shows that Generation Z has the lowest financial literacy. Future research can broaden the sample to include a wider age range and location to provide more comprehensive results across demographics. Second, this study only examines sociodemographic variables as variables of interest. Future research could analyze the other factors beyond sociodemographics that may affect financial literacy. This broader perspective would contribute to a more thorough understanding of factors affecting financial literacy.

6. Conclusion

This study aims to examine sociodemographic factors, encompassing age, gender, and access to the internet, that can increase the financial literacy of Generation Z in Surabaya. The result indicates that age and gender directly affect financial literacy, while access to the internet affects financial literacy through financial interest. Age positively impacts financial literacy since people with higher education will better understand financial concepts and face daily financial decision-making. The result also confirms that males have better financial literacy than females. It exhibits that males tend to be more risk-takers and have a greater interest in finance than females. Meanwhile, access to the internet does not have a direct effect on financial literacy. Instead, it can positively affect financial literacy through the mediating factor of financial interest.

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