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FINANCIAL LITERACY AND DIGITAL LITERACY TO AWARENESS OF INVESTMENT SCAMS AMONG INDONESIAN COLLEGE STUDENTS

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ABSTRACT

This study explores the influence between financial literacy and digital literacy, on investment sacam awareness among university students in Indonesia. Using a quantitative approach and the Structural Equation Model Partial Least Square (SEM-PLS), data was collected from 288 university students from 38 provinces in Indonesia through an online questionnaire survey. The results of the analysis show that both financial literacy and digital literacy have significant indirect effects on investment scam awareness through the mediation of cybercrime awareness. The findings support the importance of a good understanding of financial literacy and digital literacy in countering the risk of investment scams, especially in today's digital era. However, this study also found differences in the effect of financial literacy on investment scam awareness based on economic and non-economic educational backgrounds, highlighting the importance of considering demographic factors in efforts to increase investment scam awareness among university students. These findings make an important contribution to the understanding of investment fraud prevention efforts and highlight the need for a more inclusive educational approach focusing on financial literacy and digital literacy at the higher education level in Indonesia.

KEYWORDS Financial Literacy, Digital Literacy, Investment Scam

INTRODUCTION

In the contemporary era of globalization, the significance of proficient financial literacy becomes increasingly pronounced, owing to the escalating challenges and complexities within the financial domain (Atikah & Kurniawan, 2021). Financial literacy encompasses the knowledge, comprehension, and skills requisite for effective financial management, spanning budgeting, saving, investing, and personal financial planning. In Indonesia, akin to other nations, adept

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financial literacy stands as a pivotal asset, enabling individuals to make informed financial decisions and steer clear of investment fraud.

Understanding investment scams accurately constitutes a crucial aspect, particularly amidst the burgeoning complexities and dynamism of the capital markets. Investment fraud may encompass Ponzi schemes, counterfeit investment offers, or other deceptive financial practices. University students emerge as a vulnerable demographic to investment fraud due to their often limited access to requisite information and potential lack of comprehension concerning the financial realm (Kurniadi et al., 2022).

According to data from the Association of Internet Service Providers in Indonesia (APJII) , the number of internet users in Indonesia surged to 215.63 million individuals, approximately 78.19% of the nation's total population, within the timeframe of 2022 to 2023. This significant growth has reshaped societal behavioral patterns, reinforcing their reliance on digital services, particularly within the financial services sector (OJK, 2023). In the burgeoning digital age, digital literacy has emerged as a critical facet of daily life, particularly in the financial and investment spheres.

In Indonesia, with the escalating penetration of technology, particularly among university students, digital literacy becomes increasingly pertinent. Concurrently, fraudulent investments or dubious investment schemes have also proliferated as a serious threat, considering the myriad of fraud modes leveraging digital platforms. As per the report by the Financial Services Authority (OJK), from 2013 until May 31, 2023, a total of 72,618 complaints were registered concerning various fraud modes such as skimming, phishing, social engineering, and sniffing. This constitutes approximately 6.5% of the total 1,116,175 complaints received across services. Meanwhile, between 2018 and 2022, the populace incurred losses amounting to Rp126 trillion due to illegal investments (OJK, 2023). Given that university students often fall prey to fraudulent investments, the necessity of understanding digital literacy to combat detrimental investment risks becomes evident.

According to the Data & Facts on E-Government Implementation in Indonesia 2021, issued by the Ministry of Administrative and Bureaucratic Reform (Kemenpan RB), "digital literacy stands as the primary key in bolstering e-government in Indonesia." Meanwhile, in a study by the Financial Literacy Board of the OJK (2019), financial literacy in Indonesia still requires enhancement, particularly among university students. This underscores the importance of comprehending the interconnection between digital literacy and financial literacy in the investment context to avert potential scams and financial losses.

Business education, encompassing programs and curricula pertaining to finance and investment, plays a pivotal role in augmenting financial literacy and awareness of investment scams among university students. Their engagement in business education programs that refine their understanding of financial concepts and provide insights into honest and ethical business practices can furnish a robust foundation for their ability to manage personal finances and evade investment fraud.

However, notwithstanding the importance of financial literacy, awareness of investment scams, and the role of business education in this context, there exists a dearth of adequate research on this topic, particularly among university students in Indonesia. Hence, the aim of this research is to explore the correlation between financial literacy and digital literacy, vis-à-vis awareness of investment scams, among university students in Indonesia.

By deepening the understanding of these factors, this research endeavors to make a significant contribution to stakeholders, including the government, educational institutions, and the general populace.

Literature Review

Awareness of Investment Scam

Knowledge of investment fraud is considered as information about investment fraud schemes (Lee et al., 2019). This information can be obtained through various sources such as reading, experience, or education. Students who lack knowledge and awareness of investment fraud schemes may become the main target of such schemes (Teknologi MARA et al., 2020). For example, in research conducted by (Salsabila, 2018)through the Bernard Madoff case, it was found that investment fraud is often used to fulfill a luxurious lifestyle, which can tempt potential investors. In addition, research by (Holtfreter et al., 2010) shows that individuals with low self-control tend to be more vulnerable to investment fraud, especially when they cannot resist the temptation to pursue the glamorous lifestyle displayed by fraudsters. Therefore, it is important for investors to maintain their self-control to avoid being easily influenced by the lifestyle displayed by fraudsters.

Awareness of investment fraud is closely related to one's understanding and knowledge of financial information, which enables individuals to make smart financial decisions. Individuals with a strong understanding of finance demonstrate the necessary ability, motivation and confidence to apply their knowledge and understanding in financial decision-making (Lusardi et al., 2021) Psychological factors also play an important role in one's ability to understand the value of money, the effects of interest, inflation, risk, and diversification in a financial context. Research shows that low levels of financial literacy can be a strong indicator of the adoption of suboptimal investment choices (Goyal & Kumar, 2021). Therefore, a good understanding of finance can enhance one's ability to make sound financial decisions and ultimately help in accumulating assets and generating greater income (Kadoya & Khan, 2018). However, there are also findings that the more proficient a person is in finance, the greater their risk of falling victim to investment fraud (Whitty, 2020). Studies have also found that victims of investment fraud tend to be older and male.

Financial Literacy

Financial literacy consists of two main components, namely financial aspects and literacy. Financial aspects relate to knowledge and skills in managing financial aspects, while literacy relates to the ability to understand and apply financial knowledge in everyday life (Naufal, 2020).The ability of individuals to make personal financial decisions has been recognized as a result of their level of

financial literacy) (Gui et al., 2021; Huang, 2016; Lusardi, 2019). The personal management of money, savings and investments is a key aspect of personal finance, which includes budget planning, savings management, insurance coverage, mortgage arrangements and investment decision-making (Mao, 2017; Visockaite & Gedmintience, 2016). Financial literacy also involves understanding basic economic concepts, using statistics, and practically applied math skills to make financial decisions (Batsaikhan & Demertzis, 2018).

Digital Literacy

Digital literacy is the ability to use digital technology effectively and responsibly. It includes the skills to access, evaluate, and utilize information from digital sources, as well as the ability to communicate and create content using digital devices (Nedungadi et al., 2018). Digital literacy is crucial in dealing with online security challenges, especially in relation to investment scams that often occur online. Individuals with good digital literacy can not only access information wisely but also identify potential scams.

Cybercrime awareness

Cybercrime is a complex problem that involves various criminal activities through digital means, such as hacking, fraud, and cyber-stalking (Donalds & Osei-Bryson, 2019). These crimes can cause serious financial and data security losses to individuals and businesses (Smith et al., 2019). In the context of investment fraud, cybercrime can include fraudulent investment schemes that promise false returns, resulting in financial losses for victims (Al-Khater et al., 2020). Standardizing the measurement and categorization of cybercrimes is important to understand their prevalence and impact (Reep-van den Bergh & Junger, 2018). Cybercrime awareness includes understanding the risks associated with illegal investment schemes in cyberspace and the importance of keeping personal information confidential in the context of investments (Arpaci & Ateş, 2023).

The comparison of previous studies to the research described in the literature, namely research by (Duarte et al., 2022; Mohd Padil et al., 2022) has similarities in independent variables which include financial literacy, with the same research object, namely students, and data processing methods. However, there are differences in the addition of moderating variables, research location, and sample size. Meanwhile, research by (Aung & Mon, 2020; Nga et al., 2010) also examined student financial behavior, but with the addition of different independent variables, dependent variables, and moderating variables. In addition, the research location and sample size are also differences between these studies.

RESEARCH METHOD

Measurement Instrument

The measurement scale in this study was specially developed due to the lack of questionnaires available in previous studies. The construction and items were carefully crafted in accordance with the research objectives and questions, as well as the characteristics of the intended respondents. References from related literature

were also used to enhance the validity of the measurement scale. This study identified 42 items and four constructs for the creation of the questionnaire, namely financial literacy, digital literacy, cybercrime awareness, and investment fraud awareness. Part A of the questionnaire asked respondents to provide information about their demographic profile. In Part B, all respondents were asked to rate their knowledge of finance, digital access, and their level of awareness using a five-point Likert Scale, from "Strongly Disagree" to "Strongly Agree".

Sample and data collection

To explore the research model proposed, an online questionnaire was employed, targeting university students. The study garnered 288 completed responses from the student participants. Utilizing the Partial Least Squares method within the framework of structural equation modeling, the proposed research framework was scrutinized. SmartPLS-3.0 software, as outlined by (Hair et al., 2019), facilitated the examination of measurement item reliability and validity, along with the hypothesized connections among the exogenous and endogenous constructs, in line with the approach delineated by (Hair et al., 2019).

Model Development & Methods

The proposed model for this study is based on the theoretical framework and constructs derived from existing literature. The model aims to investigate the relationships between financial literacy, digital literacy, awareness of cybercrime, awareness of investment fraud, and the mediating role of awareness of cybercrime in the relationship between independent variables and the dependent variable. The construction of the model was carefully designed to align with the research objectives and questions. References from relevant literature were consulted to enhance the reliability and validity of the measurement scales used in the model.

The research employed a quantitative approach, specifically utilizing the Partial Least Squares (PLS) method within the framework of Structural Equation Modeling (SEM). PLS was chosen due to its suitability for analyzing complex relationships between latent variables, especially in exploratory research. The PLS method allows for simultaneous testing of measurement and structural models, providing a comprehensive understanding of the interrelations among variables. The analysis was conducted using SmartPLS-4.0 software, following the guidelines outlined by (Hair et al., 2019; Ringle & Sarstedt, 2016),

Steps of research are, Data Collection, the survey questionnaires were distributed online to university students, and responses were collected over a specified period. Data preparation, the collected data were cleaned, coded, and organized for analysis. Model specification, the theoretical framework and constructs were operationalized into a structural equation model, defining the relationships between variables. Measurement model evaluation, the validity and reliability of measurement scales were assessed through techniques such as convergent validity, discriminant validity, and reliability analysis. structural model evaluation, the hypothesized relationships between variables were tested using the PLS algorithm, examining both direct and mediating effects. Hypothesis testing,

the significance of relationships and mediation effects was evaluated through bootstrapping techniques, with a significance level set at 5%.

RESULT AND DISCUSSION

Demographic profile of respondents

Respondents in this study totaled 228 students from all provinces in Indonesia, with a composition of 54% female and 46% male. The majority of respondents are in the age range of 17–27 years old (66%) who are from the from the Gen Z generation, followed by the Millennial generation (31%) in the age range of 28–43 years old, and only a few from generation X (4%) in the age range of 44–59 years old.Most respondents (54%) are currently pursuing or have graduated from an undergraduate degree, while 39% are pursuing or have graduated from a master's degree, and the remaining 8% are pursuing or have graduated from a doctoral degree. The educational background of respondents is quite diverse, with the majority coming from social science study programs (42%), followed by economics, management, accounting, and administration study programs (26%), science and technology (26%), and health science clusters such as medicine, nursing, and public health (7%).

Table 1. Demographic profile of respondents

Total Respondents	228	
	Frequency	Percent
Gender		
Male	106	46%
Female	122	54%
Age		
17-27	150	66%
28-43	70	31%
44 - 59	8	4%
Education Attended		
Currently pursuing / graduating from S1	122	54%
Currently pursuing / graduating S2	88	39%
Currently taking / graduating S3	18	8%
Education Study Program		
Economics, management, accounting, administration	59	26%
Social Sciences (other than economics & business)	95	42%
Health science clusters (medicine, nursing, public health, etc.)	15	7%
SCIENCE	59	26%
Jobs		
Full-time student	112	49%

Students while working	102	45%
Study assignment students	14	6%
Average Monthly Expenditure		
<5jt	151	66%
5jt -10jt	52	23%
10 - 20m	25	11%

Measurement Model

During the initial evaluation stage, an assessment of the measurement model was conducted to test the reliability and validity of the constructs in the research framework. This assessment involved determining indicator loadings, indicator reliabilities, average variance extracted (AVE), and composite reliability values.

The validity tests showed satisfactory results. Convergent validity, assessed through loading factors and average variance extracted (AVE), indicated that all items had loading factors above 0.70 and AVE values above 0.50, confirming the convergent validity of the measurement instrument. Discriminant validity, evaluated through the Heterotrait-Monotrait Ratio (HTMT), indicated that all HTMT values were below 0.90, indicating adequate discriminant validity.

The measurement model analysis involved removing items with indicator loading values below 0.733 until achieving an Average Variance Extracted (AVE) value of at least 0.50. As a result, six items from the financial literacy construct were eliminated due to low indicator loading values during separate tests for the economics and non-economics student samples.

Reliability tests measured through Cronbach's alpha and composite reliability showed high internal consistency for all constructs, with Cronbach's alpha values exceeding 0.70 and composite reliability values above 0.70, meeting reliability assumptions.

Table 2. Summary of results for measurement model

		Convergent Validity		Internal consistency reability	
Construct	Indicator	Loading	AVE	Cronbach's alpha	Composite reability
Financial Literacy			0.656	0.976	0.978
	FL.1	0.738			
	FL.2	0.822			
	FL.3	0.788			
	FL.6	0.803			
	FL.8	0.831			
	FL.9	0.846			
	FL.11	0.853			
	FL.12	0.838			
	FL.13	0.86			
	FL.14	0.852			
	FL.15	0.858			
	FL.17	0.848			
	FL.18	0.838			

FL.19	0.868			
FL.20	0.859			
FL.21	0.897			
FL.23	0.846			
Digital Literacy		0.716	0.921	0.938
DL.1	0.864			
DL.2	0.776			
DL.3	0.843			
DL.4	0.848			
DL.5	0.889			
DL.6	0.852			
Cybercrime Awareness		0.761	0.895	0.927
CBA.1	0.81			
CBA.2	0.875			
CBA.3	0.9			
CBA.4	0.901			
Investment Scam Awareness		0.693	0.937	0.948
ISA.1	0.881			
ISA.2	0.842			
ISA.3	0.834			
ISA.4	0.828			
ISA.5	0.839			
ISA.6	0.831			
ISA.7	0.747			
ISA.8	0.853			

Figure 1 depicts the outcomes of the indicator loading in the measurement model. The composite reliability (CR) values for the constructs range from 0.733 to 0.908, indicating satisfactory reliability. According to the Fornell-Larcker criterion, the discriminant validity results presented in Table 3 demonstrate that the square root of the Average Variance Extracted (AVE) for each construct surpasses the correlation coefficient between constructs, indicating excellent discriminant validity among the constructs. In summary, the assessment of the measurement model indicates robust reliability, convergent validity, and discriminant validity, laying a solid groundwork for subsequent analyses in the evaluation of the structural model.

Figure 1. Measurement model

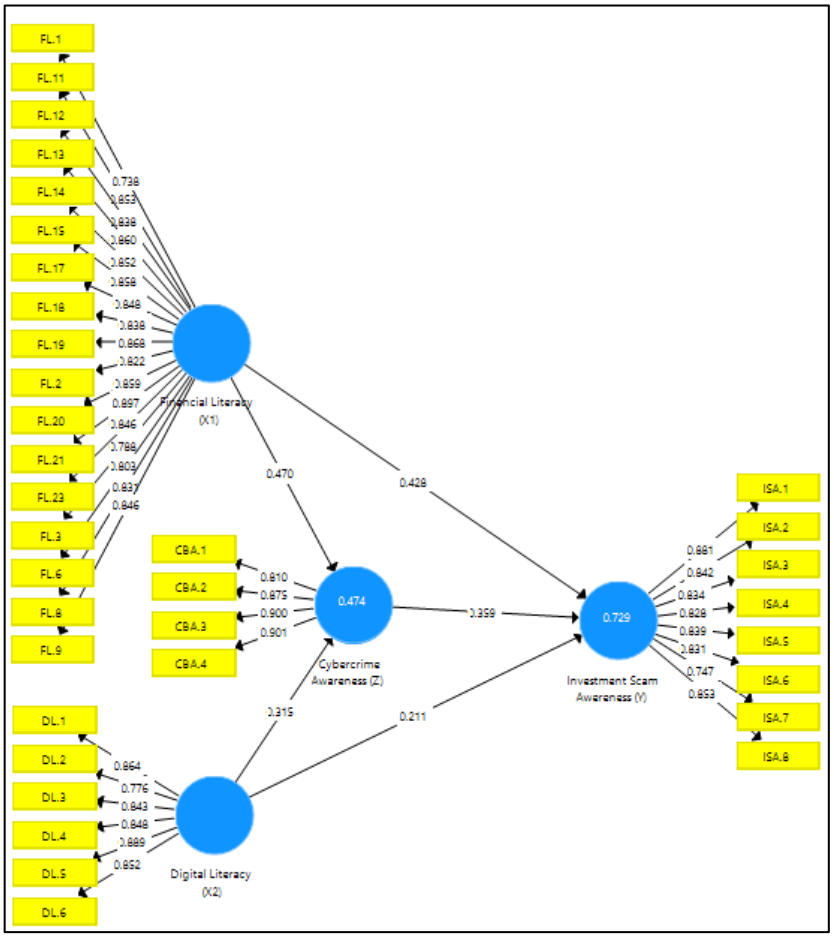

Table 3. Discriminant validity analysis

	Cybercrime Awareness	Digital Literacy	Financial Literacy	Investment Scam Awareness
Cybercrime Awareness	0.863			
Digital Literacy	0.403	0.839		
Financial Literacy	0.597	0.492	0.83	
Investment Scam Awareness	0.69	0.496	0.777	0.835

Based on the results of the mediation effect analysis with the bootstrapping test, it was found that cybercrime awareness acts as a mediator in the effect of financial literacy and digital literacy on investment fraud awareness.

The indirect effect of financial literacy on investment fraud awareness mediated by cybercrime awareness was found to be significant among all respondents ($p = 0.004$) and respondents with an economics/FEB education background ($p = 0.043$). However, this indirect effect was not significant for non-economy/non-FEB respondents ($p = 0.075$).

Meanwhile, the indirect effect of digital literacy on investment fraud awareness mediated by cybercrime awareness was found to be significant in all respondents (p = 0.022), FEB respondents (p = 0.009), and non-FEB respondents (p = 0.022).

The findings in this study support the results of previous studies showing that financial literacy and digital literacy have a direct influence on awareness of cybercrime and investment scam. (Lusardi et al., 2016; Lusardi & Mitchell, 2014) found that financial literacy is positively correlated with responsible financial behavior, including awareness of investment fraud. Similarly, (Ampbell, 2009) showed that individuals with good financial literacy are more likely to be aware of potential investment fraud. Studies by Helsper et al. (2015) confirm that high digital literacy can help individuals recognize and avoid cyber threats, including online fraud, including awareness of investment fraud on digital platforms. The findings are also consistent with the theory that cybercrime awareness acts as a mediator between financial literacy, digital literacy, and investment fraud awareness (Helsper et al., 2015; Jing Jian Xiao, 2018). However, for the mediated effect of financial literacy, significant results were only found among respondents with an economic background. This difference may be due to specific factors, such as educational or demographic backgrounds, that need to be explored further.

CONCLUSION

This research makes an understanding the role of financial literacy and digital literacy on investment scam awareness mediated by cybercrime awareness. The main findings reveal that individuals with high financial literacy and digital literacy tend to be more aware of cyber threats, which in turn increases their awareness of potential investment fraud. These results are in line with several previous studies exploring the relationship between these variables.

However, there is an interesting finding that the indirect effect of financial literacy on investment fraud awareness through the mediation of cybercrime awareness is only significant for respondents with an economic education background. This indicates that specific factors such as educational background or other demographic characteristics may moderate the relationship. This finding is consistent with previous studies that emphasize the importance of considering specific factors in understanding awareness of cyber threats.

Based on these findings, some suggestions that can be considered by related parties are as follows: a) Eucational institutions are advised to improve financial literacy and digital literacy programs in the curriculum, by adjusting teaching approaches and methods according to the background and characteristics of students. This can help increase awareness and alertness to cyber threats, including investment scams. b) Regulators and policymakers should develop educational programs and public campaigns to improve financial literacy and digital literacy. In designing such programs, it is important to consider specific factors such as educational background, age, gender and other demographic characteristics in order to effectively reach various segments of society. c) Investors and the general public are encouraged to continuously improve their

financial literacy and digital literacy, and consider specific factors such as educational background and demographics in understanding cyber threats and risks. In addition, vigilance and careful verification are required before making investment decisions to avoid fraud. d) For future researchers, it is recommended to further explore the role of specific factors such as educational background and demographics in moderating the relationship between financial literacy, digital literacy, awareness of cybercrime, and awareness of investment fraud. Further research can also be conducted to explore effective mechanisms and strategies in improving people's financial literacy and digital literacy by considering differences in individual characteristics. In addition, qualitative approaches such as in-depth interviews or case studies can be used to gain a more comprehensive understanding of the factors that influence investment fraud awareness.

By considering these suggestions, it is hoped to increase public awareness and vigilance against the threat of investment fraud, and encourage more responsible and safe investment behavior. The findings of this study can also contribute to the development of more effective strategies and policies to prevent and address investment fraud, taking into account the different characteristics of individuals and groups in society.

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