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STRENGTHENING INVESTMENT LITERACY AND DIGITAL RISK MANAGEMENT FOR GENERATION Z THROUGH INTERACTIVE EDUCATION AT VOCATIONAL HIGH SCHOOLS

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Abstract

This Community Service Program aims to enhance investment literacy and digital risk management awareness among Generation Z, specifically students at SMK 2 Percik Jagakarsa Jakarta. The methodology includes needs assessment surveys, technology-based interactive training, investment simulations, and online mentoring. Training materials cover the fundamentals of investment decision-making, financial instrument identification, diversification

strategies, and digital risks, including FOMO and asset security. Pre- and post-test results show a significant improvement in students' understanding, with an average score increase of 8.86 points ($p < 0.001$). A total of 77% of students improved their scores, with balanced progress across gender in regulatory awareness, investment psychology, and risk classification. Participant satisfaction surveys recorded average scores above 4.5 for content, delivery, and training comfort. The program not only enhances students' financial preparedness but also opens opportunities for them to become smart and responsible young investors. This initiative has the potential to serve as a sustainable model for financial literacy education at the high school level, supporting household economic resilience through a tech-savvy and investment-aware generation.

Keywords: Investment literacy, risk management, Generation Z, digital education, vocational students

INTRODUCTION

Background

Generation Z, born between 1997 and 2012, has grown up amidst rapid digital technological advancements. With broad access to the internet, social media, and digital financial platforms, they are well-positioned to begin investing at a young age. According to McKinsey, Gen Z is known for its tech-savviness, creativity, and openness to social diversity (Candra et al., 2025).

The 2025 National Survey on Financial Literacy and Inclusion (SNLIK) reports that Gen Z's financial literacy in Indonesia stands at 73.22%, with financial inclusion at 89.96% (OJK, 2025). Despite these promising figures, many students still lack understanding of basic investment principles, risk management, and how to avoid illegal investment traps, such as the DNA Pro case that harmed thousands of investors (Rosyda, 2023).

In the digital era, investment risks have become increasingly complex. Threats such as cyberattacks, data theft, and misinformation via social media can significantly influence investment decisions. Digital risk management includes protecting digital assets, securing data, and critically evaluating information (Hidayat, 2025). Equipping students with investment literacy and risk management skills is therefore essential to foster a financially intelligent and resilient generation.

Problem Statement

How can Gen Z students at SMK 2 *Percik Jagakarsa Jakarta* be supported in understanding and managing investments effectively while applying appropriate digital risk management strategies?

Objectives

- To provide Gen Z students with a clear understanding of investment and risk management concepts.
- To enhance students' ability to identify investment instruments and digital risks.
- To foster the emergence of critical, responsible, and tech-savvy young investors.

LITERATURE REVIEW

Investment Literacy among Generation Z

Gen Z has grown up with digital technology and has extensive access to financial information via social media and digital platforms. Financial literacy is a crucial foundation for shaping wise investment behaviour in this demographic (Mu'afi et al., 2025). Studies show that financial literacy significantly influences Gen Z's investment interest and decisions, particularly in capital markets and digital assets (Ashfaq et al., 2024; Jain et al., 2023).

However, the high penetration of social media also introduces risks of invalid or manipulative information. Candra et al. (2025) emphasize that digital literacy serves as a critical filter to avoid impulsive decisions driven by investment hoaxes. The DNA Pro case exemplifies how young investors can fall into illegal schemes due to a lack of regulatory and risk understanding (Rosyda, 2023).

To deepen this understanding, Behavioural Finance Theory (Kahneman & Tversky) offers a lens to interpret Gen Z's cognitive biases—such as overconfidence, herd behaviour, and susceptibility to FOMO (Fear of Missing Out). These biases are often amplified by algorithm-driven content on social media, which can distort risk perception and encourage impulsive investment decisions.

Cross-national comparisons further highlight contextual differences. For instance, youth investment behaviour in India and Brazil reflects similar digital enthusiasm but diverges in regulatory awareness and access to financial education. This underscores the need for localized interventions that consider socioeconomic and cultural factors.

Moreover, parental influence, peer networks, and early exposure to financial tools play a critical role in shaping Gen Z's financial attitudes. Lusardi & Mitchell (2014) emphasize that

financial literacy is not only a cognitive skill but also a socialized behavior, requiring sustained education and mentorship.

Risk Management in the Digital Era

Digital risk management involves identifying, assessing, and mitigating technology-related threats such as cyberattacks, data breaches, and system failures (Hidayat, 2025). These risks affect not only large corporations but also individual investors using financial apps and online investment platforms. Understanding data security, encryption, and digital asset protection is integral to modern investment literacy (Arlt, 2022). Effective risk management strategies include portfolio diversification, risk profiling, and the use of secure, verified technologies (Hanafi, 2020; Suryana et al., 2020). OJK also highlights the importance of consumer education and protection in digital financial products, including the formation of the Investment Alert Task Force to prevent illegal practices (Suwondo, 2022).

In the digital investment landscape, risk management extends beyond traditional financial metrics to encompass cybersecurity, data privacy, and platform integrity. Hidayat (2025) defines digital risk management as the proactive identification and mitigation of threats such as phishing, data breaches, and misinformation—risks that are increasingly relevant to individual investors using mobile apps and fintech platforms. The rise of algorithmic trading, robot-advisors, and decentralized finance (DeFi) introduces new layers of complexity. While these technologies offer convenience and access, they also pose risks related to transparency, ethical use of data, and regulatory oversight. Arlt (2022) and FMIPA UNPAD (2022) stress the importance of investor education in navigating these digital tools safely.

Psychologically, Gen Z's digital nativity may lead to underestimation of long-term risks. Their comfort with technology can obscure the need for critical evaluation and secure practices, making digital risk education essential in shaping resilient investment behaviour.

The Role of Education and Technology

Contextual, technology-based financial education has proven effective in improving students' understanding of investment and risk concepts. Interactive approaches such as investment simulations, case studies, and app-based training have shown success in enhancing financial literacy among high school students (Widagdo & Lestari, 2018; Nuzula & Nurlaily, 2020). Digital platforms also provide access to investment instruments like stocks, mutual funds, and digital gold with affordable capital, enabling Gen Z to start investing early provided they have adequate understanding (Budiman, 2019; Filbert, 2021). Pedagogically, Constructivist Learning Theory supports the use of experiential and contextual learning, where students

actively construct knowledge through real-world scenarios. Digital experiential learning, in particular, aligns with Gen Z's preferences for autonomy, interactivity, and immediate feedback.

However, equity in access remains a challenge. Students in underserved regions may face barriers such as limited internet connectivity, lack of devices, and low digital literacy. Addressing these gaps requires inclusive program design and collaboration with stakeholders across education, technology, and finance sectors.

Furthermore, longitudinal studies suggest that early exposure to financial education—especially when integrated into formal curricula—can lead to sustained improvements in financial behaviour. Budiman (2019) and Filbert (2021) advocate for scalable models that combine theoretical instruction with practical application, preparing students not just to invest, but to do so wisely and ethically.

METHODOLOGY

Program Design

This Community Service Program was designed as an educational initiative using participatory and digital technology-based approaches. Its goal was to improve investment literacy and digital risk management among Generation Z students through interactive training, simulations, and online mentoring. The approach aligns with experiential learning principles, emphasizing active participant engagement (Kolb, 1984).

Implementation Methods

The program was conducted in five main phases:

- **Socialization and Initial Survey**- A needs assessment survey and interviews were conducted to identify students' levels of investment literacy and digital risk awareness. Survey instruments were based on OJK's financial literacy indicators and recent literature (Mu'afi et al., 2025; Ashfaq et al., 2024).
- **Interactive Training**- Training materials included investment fundamentals, financial instrument classification, diversification strategies, and digital risks such as FOMO and data security. Training was delivered interactively using students' mobile devices, incorporating case studies and simulations (Widagdo & Lestari, 2018).
- **Technology Integration-** Digital platforms were used to deliver materials, conduct investment simulations, and assess participants' understanding in real time. This enabled personalized learning and progress tracking (Filbert, 2021).
- **Mentoring and Evaluation-** Students received guidance in selecting investment instruments aligned with their risk profiles. Evaluation was conducted using pre- and

post-tests to measure improvements in financial literacy and risk awareness (Budiman, 2019).

- **Program Sustainability-** The program was designed for long-term sustainability through advanced module development and integration into the school's entrepreneurship curriculum, addressing the evolving financial and digital risk landscape (Hidayat, 2025; Suwondo, 2022).

Partner Participation

SMK 2 *Percik Jagakarsa Jakarta* served as the program's implementation partner, facilitating participant coordination, training space, and technical support. A total of 35 students from grades XI and XII actively participated.

Program Evaluation

Evaluation was conducted in two forms:

- **Impact Evaluation-** Statistical analysis of pre- and post-test results was used to assess training effectiveness. A paired t-test was applied to determine score improvements (Candra et al., 2025).
- **Sustainability Evaluation-** Participant satisfaction and interest in follow-up training were assessed through surveys. Results indicated strong interest in entrepreneurship and digital technology topics (Nuzula & Nurlaily, 2020).

RESULTS AND DISCUSSION

Pre-Test and Post-Test Outcomes

The investment literacy and risk management training program delivered to 35 students at SMK 2 PERCIK demonstrated a significant improvement in participants' understanding. Figure 1 presents Boxplot Comparison of Pre-Test and Post-Test Scores in the PKM25 Program. The boxplot comparison illustrates the following key findings:

- The overall distribution of post-test scores is notably higher than that of the pre-test.
- The post-test median is elevated, and the score range reflects a more uniform improvement in comprehension.
- Several outliers with low scores were observed in the pre-test but were absent in the post-test—indicating that even students with initially limited understanding experienced meaningful progress.

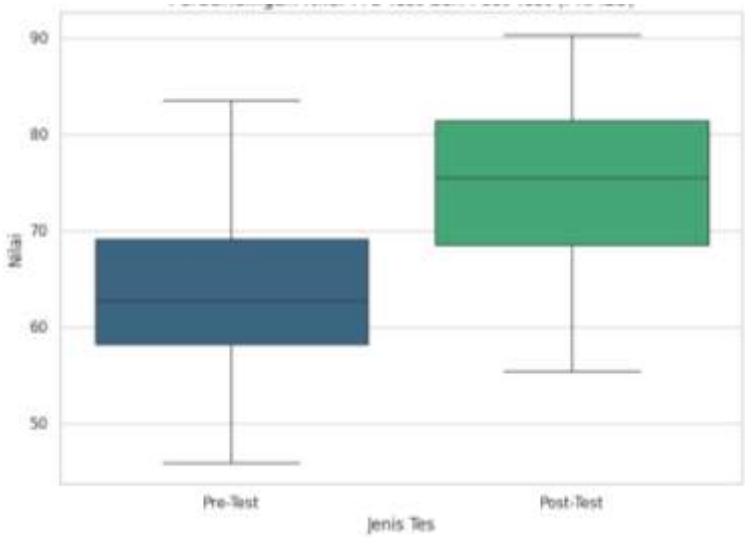

Figure 1. Boxplot Comparison of Pre-Test and Post-Test Scores

Table 1. t Test Statistics

Statistics	Score
t-statistic	-4,94
p-value	< 0,001
Degree of freedom	35
Average	-8,86

Interpretation:

- A p-value of < 0.001 indicates a statistically significant difference between the pre-test and post-test scores.
- Given that the average post-test score is higher, it can be concluded that the PKM25 program had a positive impact on enhancing participants' understanding.
- The negative t-value signifies that post-test scores were consistently higher than pre-test scores.

Training yielded significant improvements in participants' understanding. Average pre-test scores were 77.43, increasing to 86.29 post-training, with a mean difference of +8.86 points. A paired t-test showed t = -4.94 and p < 0.001, indicating statistical significance. Score distribution revealed:

- 77% of students improved,
- 17% remained unchanged,
- 6% declined.

Notable improvements were observed in portfolio diversification, identification of low-risk instruments, and avoidance of FOMO-driven decisions.

Gender-Based Analysis

Table 2 presents a gender-based analysis, indicating that male students achieved slightly higher average scores on both the pre-test (80.0) and post-test (89.0) compared to female students (76.4 and 85.2, respectively). However, female students demonstrated a stronger understanding of regulatory and psychological aspects of investment, such as the importance of OJK licensing and the impact of FOMO on financial decision-making. In contrast, male students excelled in identifying conservative instruments and asset classification. These findings support the study by Mu'afi et al. (2025), which suggests that financial literacy outcomes vary depending on context and individual characteristics, including gender and digital experience.

Table 2. A Gender-Based Analysis

Gender	Respondent Total	Average - Pre-test Score	Average -Post-test Score	Increase average
Female	25	76.4	85.2	+8.8
Male	10	80.0	89.0	+9.0

Male students scored slightly higher on average (pre-test: 80.0; post-test: 89.0) than female students (pre-test: 76.4; post-test: 85.2). However, female students demonstrated a stronger understanding of regulatory and psychological aspects, such as OJK licensing and FOMO's impact on financial decisions. Male students excelled in identifying conservative instruments and asset classification. These findings align with Mu'afi et al. (2025), who note that financial literacy varies by individual characteristics, including gender and digital experience.

Satisfaction Survey Results

A satisfaction survey assessed training content, delivery, and comfort. Average scores exceeded 4.5 across all aspects, indicating high satisfaction. No significant differences were found based on gender or prior investment experience, confirming the program's inclusivity and effectiveness. Interest in follow-up training was high, especially in entrepreneurship and digital technology topics.

Table 3. A Satisfaction Survey Score

Assessment Aspects	Average Score	General Interpretation
Training topic was engaging	4.72	Very Engaging
Content was relevant and interesting	4.64	Very Engaging
Material was easy to understand	4.36	Easy–Very Easy
Instructor's delivery was easy to follow	4.42	Very Easy
Environment and equipment were comfortable	4.47	Very Comfortable

Note: Scores above 4 indicate a very high level of participant satisfaction.

CONCLUSIONS

Based on quantitative and qualitative analysis of the training program on investment literacy and digital risk management, the following conclusions can be drawn:

1. **Investment Literacy Before and After Training-** Prior to the training, Gen Z students' investment literacy was moderate, with an average pre-test score of 77.43. Post-training scores increased significantly to 86.29 ($p < 0.001$), indicating the effectiveness of the educational approach, which included case studies, simulations, and interactive discussions. Students demonstrated improved understanding of investment fundamentals, asset classification, and portfolio diversification strategies.
2. **Understanding of Digital Risk Management-** The training successfully raised students' awareness of digital risks associated with investment activities, such as online fraud, illegal platforms, and cyberattacks. Students were able to identify mitigation steps such as platform legality verification, two-factor authentication, and secure personal data management. These findings align with literature emphasizing the importance of digital risk management in shaping safe and sustainable investment behavior (Hidayat, 2025; Arlt, 2022).
3. **Training Program Effectiveness-** The program proved effective in enhancing financial literacy and risk awareness. This was reflected in improved test scores, positive satisfaction survey responses, and strong interest in follow-up training. Students expressed enthusiasm for advanced topics such as digital entrepreneurship, business finance, and AI-based financial decision-making. The effectiveness was reinforced by a learning approach tailored to Gen Z's characteristics—technology-based, contextual, and interactive (Candra et al., 2025).

Recommendations

Based on the findings and reflections from program implementation, the following recommendations are proposed:

A. For Educational Institutions

- Integrate financial literacy and digital risk management into formal curricula, especially at the high school level, using project-based and simulation-based approaches.
- Involve industry practitioners and regulators (e.g., OJK and IDX) in training to provide real-world perspectives and strengthen material validity.
- Utilize interactive digital platforms for advanced training, including investment gamification, capital market simulations, and cybersecurity education.

B. For Students and Generation Z

- Enhance financial literacy through active participation in seminars, training, and credible investment communities.
- Always verify the legality of investment platforms and be cautious of offers promising instant profits without risk.
- Leverage technologies such as AI and financial apps to support risk analysis and objective decision-making.

C. For Researchers and Program Developers

- Conduct longitudinal studies to measure the long-term impact of financial literacy on investment behaviour.
- Introduce new variables such as digital literacy, social media influence, and emotional intelligence in Gen Z investment behaviour analysis.
- Develop web- and mobile-based training modules accessible to students from diverse socioeconomic backgrounds.

RESEARCH LIMITATIONS

This study has several limitations that should be considered in interpreting results and developing future programs:

- **Methodological Limitations-** The study used a descriptive quantitative design with pre- and post-tests, which effectively measured knowledge change but did not fully capture long-term behavioural dynamics. Longitudinal research is needed to assess sustained financial practices.
- **Contextual and Representational Limitations-** The study was limited to one urban educational institution, so generalizing results to the national Gen Z population should be

done cautiously. Socioeconomic factors, technology access, and local culture may influence program effectiveness elsewhere.

- **Digital Literacy and Ethical Limitations-** Although students showed improvement in investment literacy, challenges in digital literacy remain, such as limited critical thinking about online information, exposure to algorithmic bias, and low ethical awareness in digital media use (Anisti et al., 2024).
- **Understanding of Financial Technology Risks-** Digital risk management was still limited among participants, especially regarding financial technologies such as cryptocurrency, blockchain, and data security. Knowledge of regulations and mitigation strategies needs to be expanded through advanced training (Zikrillah et al., 2025).

It is important to acknowledge that the limitations of the current study may potentially restrict the generalizability of the findings. Future research should consider broader sampling, longitudinal designs, and cross-regional comparisons to validate and extend these insights.

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