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Enhancing Gen Z's Digital Financial Inclusion through Interactive Flipbooks and Contextual Learning: A Participatory Action Research

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Abstract

The low financial inclusion index among 15–17-year-olds, at only 57.96%, highlights an urgent need for targeted interventions. Financial inclusion is an important factor in the growth and development of a country, as well as a driver of the achievement of the SDGs. Therefore, community service activities were carried out focused to increase Gen Z's understanding and active participation in financial services. This community service activity uses the Participatory Action Research (PAR) method, which consists of five stages: Research and Intervention Goals, Assessment of Needs, Action Planning, Action Taking, and Project Outcomes. A total of 427 tenth-grade students from senior high school in Surabaya participated. Interventions included the development and classroom use of interactive flipbooks on Central Banking, Payment Systems, and Payment Instruments, combined with contextual learning activities such as financial education sessions with Bank Indonesia, bank account openings, and hands-on digital transactions (e.g., QRIS, e-wallets, and mobile banking) during a school entrepreneurship bazaar. Data were collected through pre- and post-tests, structured questionnaires, interviews, and behavioral observations. Quantitative analysis was used to measure cognitive gains (test scores) and behavioral indicators (account openings and digital transaction frequency). The results showed a significant increase in students' knowledge and participation in formal financial systems. The combination of interactive digital media and contextual experiential learning effectively bridged the gap between Gen Z's digital potential and their financial inclusion. This model can be scaled nationally to support inclusive economic development among youth.

Keywords: Flipbook, Financial Inclusion, Contextual Learning, Community Service
SDGs: Goal 4 (Quality Education), Goal 8 (Decent Work and Economic Growth), Goal 10 (Reduced Inequality)

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INTRODUCTION

Financial inclusion is the availability of access to products and services provided by business actors in the financial sector that are quality, affordable, and sustainable following the needs and capabilities of the community to improve financial well-being (Otoritas Jasa Keuangan, 2024). Financial inclusion is one of the priorities of various countries worldwide, so many countries are formulating strategies to integrate their citizens into the formal financial system (Beloke et al., 2024). Chitimira and Warikandwa (2023) found that financial inclusion contributes to increasing economic development and GDP by up to 14% in emerging markets, including Indonesia. Financial inclusion is also one of the main drivers of the Sustainable

Development Goals (SDGs) and has a direct impact on economic growth, poverty reduction, and gender equality (Makanyeza et al., 2023). Financial inclusion is explicitly mentioned in 17 SDGs, which shows the importance of financial inclusion in achieving the success and sustainability of the world economy (Chitimira & Warikandwa, 2023).

The level of financial inclusion of a country can be seen through the financial inclusion index, which is generally measured by access to, use of, and quality of financial services. World Bank (2021) shows that Indonesia's financial inclusion index is still far from the global average, namely in terms of formal account ownership, use of digital transactions, and access to formal financing (see Figure 1).

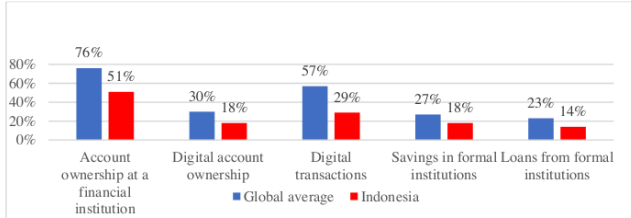


Figure 1. Position of Indonesia's Financial Inclusion Index
Source: World Bank (2021)

Based on Figure 1, it is known that Indonesia's financial inclusion index is below the world average, both in terms of account ownership in financial institutions, digital account ownership, digital transactions, and loans from formal institutions. These data reflect the still low level of access and participation of the Indonesian people in the formal financial system compared to global standards. In addition, Figure 2 shows the results of the financial inclusion survey conducted by the Financial Services Authority (OJK), showing that there has been an increase in the financial inclusion index in Indonesia from 2013 - 2022.

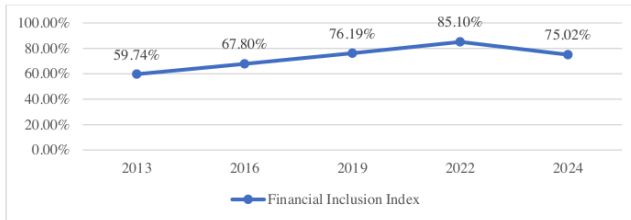


Figure 2. Indonesia's Financial Inclusion Index 2013 – 2024
Source: Otoritas Jasa Keuangan (2022, 2024)

Figure 2 shows the trend of Indonesia's financial inclusion index from 2013 to 2024 based on data from the Otoritas Jasa Keuangan (2022, 2024). There is a consistent increase from 2013 (59.74%) to a peak in 2022 of 85.10%. This increase indicates a successful effort to expand public access to formal financial services. However, in 2024, there was a decrease of 75.02%, indicating new challenges or factors that caused a decline in public participation in the formal financial system. However, the increase has not been able to reach the target set by the government in Presidential Regulation No. 114 of 2020, which is 90% by 2024 (Otoritas Jasa Keuangan, 2024). This shows that there is a considerable gap between the targeted index and the achieved index, which is 14.98%.

OJK (2024) also found that the lowest financial inclusion index is at the age of 15 – 17, which is 57.96%. On average, this age is currently studying at the high school level. McKee-Ryan, (2021) classified this age as the Zoomer Generation (Gen Z), namely individuals born between 1996 – 2012. As a generation growing up in the digital era, Gen Z has excellent potential to become active users of digital financial services. However,

the low level of financial inclusion among them indicates a gap between their digital potential and access or understanding of the available financial ecosystem.

Low financial inclusion among Gen Z is a strategic challenge that must be responded to immediately, given the rapid flow of digital transformation in the national payment system and the expansion of cashless payment systems. This urgency is reinforced by the fact that Gen Z is currently shaping financial behaviors that will impact their future consumption, saving, and investment patterns (Lührmann et al., 2015; Narmaditya et al., 2023). Without appropriate educational interventions, the risk of low literacy and participation in the digital financial system can hinder government efforts to realize an economically and financially inclusive society (Hasan et al., 2021). In addition, the low participation of Gen Z in digital financial services can hinder the effective adoption of technology (Kumar & Shrestha, 2023; Sikka & Bhayana, 2024). Therefore, a structured and contextual strategy is needed to increase digital financial inclusion among high school students. One approach that can be used is gradual and collaborative educational activities. This approach starts by providing basic material on the role of the central bank, Payment System, and Payment Instruments as a foundation of knowledge. This material is included in one of the economic learning outcomes for class X at the high school level or Phase E (Kementerian Pendidikan dan Kebudayaan, 2022).

However, based on the results of observations conducted at SMAN 6 Surabaya and SMAN 15 Surabaya, it was found that students' learning outcomes in Central Bank materials, Payment Systems, and Payment Instruments still did not reach optimal completeness. This shows that students have not understood the material well. Based on the results of interviews with students, it is known that they have difficulty understanding the material because the media and methods used do not follow their characteristics, which tend to be visual, interactive, and contextual. In addition, the learning resources used in package books are considered incomplete and in-depth and less able to relate to the reality of the current digital economy. Amalina (2024) shows that monotonous and non-interactive teaching media significantly affect students' low interest and understanding of economic materials, especially Central Banks, Payment Systems, and Payment Instruments.

This condition indicates the need to develop more comprehensive, engaging, and accessible learning resources, such as digital-based learning media such as interactive flipbooks. Yulaika et al. (2020) proved that digital teaching materials in the form of flipbooks positively impact economic learning outcomes. In addition, combining digital teaching materials with contextual learning methods based on socialization and hands-on practice is an effective strategy for answering the challenges of economic learning in the digital era, especially for Gen Z students. Setiadi and Ghofur (2020) found that contextual economic learning can improve achievement and mastery of the material. Kuswanto & Refnida (2020) proves that contextual learning is efficacious in improving student learning outcomes.

Considering the low learning outcomes of students, limited learning resources, and the characteristics of Gen Z who demand a more adaptive and relevant learning approach, an innovation is needed in developing interactive digital learning resources and applying contextual learning methods based on socialization and direct practice (Miroshnichenko, 2024). The combination of interactive flipbook teaching materials and direct education from related institutions such as Bank Indonesia is expected to be able to bridge the gap in understanding economic materials, especially on the topic of Central Bank, Payment Systems, and Payment Instruments. These innovations not only support the achievement of more optimal learning outcomes but also encourage increased digital financial inclusion among high school students as part of Generation Z.

The purpose of this community service activity is to increase digital financial literacy and inclusion among Gen Z, especially students of SMAN 6 Surabaya and SMAN 15 Surabaya, through the development of digital-based teaching materials in the form of interactive flipbooks and the application of contextual learning methods involving socialization and direct practice with Bank Indonesia. These activities are expected to form a young generation that is financially capable, adaptive to the development of the digital economy, and participates in increasing financial inclusion in Indonesia. Therefore, this community service initiative not only addresses the practical challenges of low financial inclusion among Gen Z but also contributes to the development of knowledge in both theory and practice. Theoretically, it enriches the discourse on digital financial literacy and contextual learning strategies for digital-native students. Practically, it introduces an integrative model that combines interactive digital media and real-life financial practice, which can be adapted in similar educational contexts to support inclusive economic development.

METHOD

The community in this service activity was students at SMAN 6 Surabaya and SMAN 15 Surabaya, who were part of Gen Z. The two schools were chosen because they faced crucial problems related to students'

understanding of Central Bank materials, Payment Systems, and Payment Instruments. Participants in this activity totaled 427 students, with 184 males and 243 females. They played an active role in all activities, from filling out pre-test and post-test instruments and using interactive flipbooks in economic learning to participating in direct practices such as opening accounts, socializing using QRIS, and conducting digital transactions in school entrepreneurial bazaar activities. The direct involvement of students as subjects and learning partners allowed the application of a participatory-contextual approach, which was at the core of the Participatory Action Research (PAR) method used in this activity.

This community service activity used the Participatory Action Research (PAR) method to involve the active participation of researchers and community members in a collaborative joint learning process. The PAR strategy was based on the assumption that the active involvement of the affected communities in solving a problem was essential for a meaningful solution to the problem (Sarri & Sarri, 1993). The PAR approach ensured that the interventions were relevant, participatory, and sustainable in addressing the gap between digital potential and actual financial inclusion among Generation Z students.

The effectiveness of the community service activities was measured using quantitative indicators. Pre and post-activity assessments were conducted to measure changes in students' understanding of Central Bank, Payment Systems, and Payment Instruments. The assessment instruments included structured questionnaires and concept comprehension tests developed by the service team in collaboration with economics teachers. In addition, behavioral indicators were used to assess students' active financial participation, such as the number of students opening bank accounts and their ability to use digital financial tools like QRIS, e-wallets, and mobile banking before and after the intervention.

The implementation of this community service followed the five stages of Participatory Action Research (PAR) as outlined by Sarri & Sarri (1993). The first stage, Research and Intervention Goals, involved the collaborative formulation of objectives between the service team from the PPG Economics Program at the State University of Surabaya and economics teachers from SMAN 6 and SMAN 15 Surabaya. The shared goal was to increase digital financial inclusion among Gen Z students. In the second stage, Assessment of Needs, the team conducted observations, student interviews, and an analysis of existing learning outcomes to identify gaps in students' understanding of central banking, payment systems, and payment instruments. The third stage, Action Planning, was carried out through joint discussions to develop strategic steps aligned with the identified needs. This included designing interactive digital flipbooks and planning contextual learning activities. The fourth stage, action-taking, involved the implementation of the planned interventions: distributing the flipbooks for classroom learning, conducting educational sessions with Bank Indonesia, facilitating student bank account openings in collaboration with Bank Mandiri, and organizing real-life financial practices through a school bazaar using digital payment tools. Finally, the fifth stage, Project Outcomes, evaluated the impact of these activities.

The analysis technique used was quantitative descriptive. It involved comparing the results of the pre-test and post-test to observe the increase in students' understanding of the material on economics and digital financial inclusion. Data was displayed as averages, percentages, and value differences to show the interventions' cognitive impact. In addition, behavioral data such as the number of account openings and the use of digital payment instruments were analyzed descriptively to describe student participation in formal financial services.

RESULTS AND DISCUSSION

Research and Intervention Goals

The community service team from teacher professional education (PPG) Economics of the State University of Surabaya collaborates with economics teachers at SMAN 6 Surabaya and SMAN 15 Surabaya in determining the direction and strategic objectives of the implementation of activities. The main goal of this community service program is to increase digital financial inclusion among Generation Z, exceptionally high school students who are in the age range with the lowest financial inclusion index. This activity is expected to strengthen students' understanding of economic concepts, especially Central Banks, Payment Systems, and Payment Instruments, as well as introduce real practices of digital financial services such as QRIS and e-wallets. By expanding students' access and understanding of the digital financial system, it is hoped that they will be able to participate actively and wisely in the formal financial system to increase financial inclusion on a macro level.

Assessment of Needs

The right strategy will achieve the goals that have been formulated in advance. Therefore, to ensure that the designed goals can be realized, needs analysis is needed so that students' needs can be met. Needs analysis was conducted through classroom observation activities, in-depth interviews with several students and economics teachers, and data collection of previous learning outcomes.

Based on the needs assessment results, it was found that students' understanding of economic materials, especially those related to the financial system, is still low. This is due to the lack of learning resources, namely in the form of package books with limited essential materials, less contextual package books, and learning methods that do not follow the visual and digital-native characteristics of Gen Z. These findings are an important basis for designing solutions that are innovative, applicative, and based on hands-on experience.

Action Planning

Based on the needs analysis results, the community service team collaborated with economics teachers at SMAN 6 Surabaya and SMAN 15 Surabaya to prepare an action plan. The action plan was planned through joint discussions at SMAN 15 Surabaya. The community service team and economics teachers will involve two main approaches: the development of digital learning media and the implementation of practice-based learning. Interactive Flipbook-based teaching materials were chosen as teaching resources because they present material visually, attractively, concisely, and easily accessible via digital devices.

In addition, collaborative activities in the form of direct socialization by Bank Indonesia were also designed, which included material on the Quick Response Indonesian Standard (QRIS), consumer protection, Love, Pride, and Understanding (CBP) Rupiah. The community service team and economics teachers also collaborated with Bank Mandiri to organize account openings for students at school. Finally, the practice of using e-wallets in school transactions is carried out. The four strategies were chosen because they can connect theoretical and conceptual material with real practice so that students can more easily understand, internalize, and apply the material taught so that it can support the achievement of Indonesia's financial inclusion targets.

Action Taking

Community service activities at SMAN 6 Surabaya and SMAN 15 Surabaya were carried out as planned in two main forms. First, the development and distribution of interactive flipbooks using the Heyzine Flipbook application. Heyzine allows users to turn PDFs into interactive flipbooks with realistic page-flipping effects without watermarks or ads, even in the free version, as shown in Figure 3.



Figure 3. Central Bank Flipbooks, Payment Systems and Instruments
Source: Author Documentation

Figure 3 shows the flipbook that has been successfully developed with Heyzine apps. The flipbook is directly used in learning activities in class X. The flipbook is compiled based on the Independent Curriculum and is equipped with illustrations, interactive video links, and quizzes as an evaluation. The flipbook is also accompanied by Student Worksheets (LKPD) and learning activities that can stimulate the active participation of students. Second, a socialization session was held, with Bank Indonesia East Java as a speaker. Students were enthusiastic about listening to the material and participating in the evaluation. The material was delivered in three sessions: QRIS material, consumer protection, and Rupiah CBP. The material was delivered using

interactive slides accompanied by interesting quizzes using Kahoot, Quizizz, and Google Forms. In addition, the service team and economics teachers of SMAN 15 Surabaya collaborated with Bank Mandiri to open a savings account for students who have met the requirements, namely those who are 17 years old. Students who open an account get cashback directly through each student's account.

Furthermore, an entrepreneurship bazaar and shopping practice using QRIS were carried out through digital banking applications and e-wallets. Class XII students acted as traders in the bazaar activity with various products, such as food, handicrafts, and photo services. Consumers, including school residents, teachers, students, practical teachers, staff, and security guards, must make payments by scanning the QRIS at each bazaar stand. In addition to the bazaar, donation or charity activities were held to maintain the SMAN 15 Surabaya Mosque, where students can donate a minimum of IDR 15 through QRIS.

Project Outcomes

Community service activities involving the residents of SMAN 6 Surabaya and SMAN 15 Surabaya have produced several outputs and positive impacts, especially in supporting financial inclusion. The first result is an increase in students' understanding of Central Bank materials, Payment Systems, and Payment Instruments. Interactive flipbooks are an alternative learning medium easily understood and suitable for their learning style and characteristics. The improvement of students' knowledge and understanding is shown through the results of their scores on quizzes which increased significantly after the intervention.

Based on the cognitive assessment using pre-tests and post-tests, the students' average score increased from 68 to 89, indicating a 21-point gain. This represents a 30.9% improvement in understanding economic materials related to Central Bank, Payment Systems, and Payment Instruments. The data clearly demonstrate the effectiveness of the intervention in enhancing students' financial knowledge. The increasing of the average post-test score reached 89, indicating a substantial gain in students' comprehension of Central Bank materials, Payment Systems, and Payment Instruments after using interactive flipbooks and participating in contextual learning activities.

In addition, there has been an increase in digital financial inclusion among students, which is characterized by increased participation in bank account opening and the use of digital payment instruments such as QRIS and e-wallets. More than 100 students opened accounts and digital banking or mobile banking applications in this activity. In the entrepreneurial bazaar activity, transactions through QRIS reached around IDR 18 million. Bank Indonesia gives appreciation to the class with the most transactions. Bank Indonesia gives reward to the class with the most transactions in the student bazaar activity as a form of appreciation for active participation in using digital payment tools.

Community service activities are designed in response to the low financial inclusion index in the age group of 15–17 years, which is 57.96% (Otoritas Jasa Keuangan, 2024), the majority of whom are at the high school level and categorized as part of Generation Z. This age group has great potential to adopt digital financial services because it grows in the technological era called digital natives (Ameen & Anand, 2020). However, the reality shows that they still have limitations regarding understanding and active participation in the formal financial system. Gen Z considers banking institutions very exclusive (Kangwa et al., 2021). This shows a gap between digital potential and financial inclusion, the main research gap in this service activity.

Based on observations and interviews conducted at SMAN 6 and SMAN 15 Surabaya, it was found that participants' understanding of materials such as Central Banks, Payment Systems, and Payment Instruments is still low. This is due to the limited learning resources, where the existing learning resources are not contextual and do not match the learning characteristics of Gen Z. In line with Amalina (2024), which shows that the use of monotonous and non-interactive teaching media hurts students' interest and understanding, especially in economics subjects. In general, Gen Z prefers learning with an interactive, collaborative, and digital-based approach (Khan & Al-Shibami, 2019). Nurzaman et al. (2024) and Usman et al. (2024) also found that Gen Z students prefer interactive and engaging learning methods, such as digital flipbooks, which can enhance their reading comprehension and engagement with the material.

Alternative solutions offered to overcome the problem are the development of teaching materials in the form of interactive flipbooks and contextual learning through direct practice with Bank Indonesia and Bank Mandiri. The strategy is not only relevant to the needs of students but is also supported by various previous studies. Gen Z students often prefer multimodal learning, which combines various forms of media and interactive elements, and digital flipbooks cater to this preference by integrating text, images, and interactive features (Gil, 2017; Ishak et al., 2022). Azizah et al. (2022), Niâ et al. (2024), and Yulaika et al. (2020) stated that the use of digital flipbooks in economic learning can increase students' motivation and learning outcomes

because they present the material in an engaging and easy-to-understand manner. Firdaus et al. (2024) proves that flipbooks can significantly improve the quality of teaching and student engagement. The use of flipbooks that utilize digital technology is also in line with the preferences of Gen Z who are growing up with the internet and digital technology so that they will be more comfortable learning with digital tools and platforms (Alruthaya et al., 2021). The integration of digital tools like flipbooks in education not only aligns with Gen Z's digital habits but also promotes better learning outcomes and digital literacy skills (Lim et al., 2022; Moundy et al., 2025). Meanwhile, Setiadi & Ghofur (2020) found that contextual-based economic learning and field practice can improve conceptual mastery, reduce the gap between theory and reality, and increase learners' active participation in learning.

Socialization activities and practices carried out in the program, such as education on the use of QRIS, bank account opening, and direct practice of using digital financial services (e-wallets, m-banking, and QRIS), can increase their involvement and confidence in accessing these financial services (Silinskas et al., 2023). Gen Z has a perception where they consider banking institutions to have an exclusive ecosystem, and it is difficult to meet their needs for digital payment tools (Kurniawan et al., 2023), so socialization from banking institutions can remove this perception. This is in line with the findings of Mancone et al. (2024) and Yang et al. (2023) which show that digital financial practice activities in schools can significantly increase financial literacy and inclusion. Showkat et al. (2025) also proves that introducing digital and financial literacy in the school environment can optimize the benefits of fintech services for students. This increase shows that students have been included to prevent future financial problems.

Overall, the results show that the combination of digital learning resources and contextual approaches based on socialization and practice can be an effective model in answering the challenge of low digital financial inclusion among Gen Z. These results are in line with the findings of Faye & Ravneberg (2024) which show that adapting learning activities to the specific needs of Gen Z can improve their digital financial literacy and competence. Not only was there an increase in understanding of economic materials, but also an increase in the active participation of students in formal financial services, such as opening bank accounts and using QRIS and e-wallets. Thus, these activities can be an example of best practice in supporting strategies to increase financial inclusion targeting Gen Z as part of inclusive economic development for the younger generation.

Although this service activity has shown positive results in increasing Gen Z's understanding and participation in digital financial inclusion, this activity has some limitations. First, the activity location's scope is limited to two schools in Surabaya, namely SMAN 6 and SMAN 15. Second, the impact measurement aspect still focuses on early cognitive and behavioral indicators, not yet reaching the systematic influence on sustainable financial habits. Therefore, follow-up research with a broader scope and longitudinal approach is urgently needed to ensure the sustainability and effectiveness of the developed models.

This service activity directly supports the achievement of several SDGs, especially SDGs 4, SDGs 8, and SDGs 10. SDGs 4 are reflected in efforts to improve digital financial literacy through the development of interactive and contextual learning resources that follow the characteristics of Gen Z. Meanwhile, SDG 8 is supported through increasing financial literacy and inclusion, which is an important capital for the younger generation to participate in productive economic activities actively. SDG 10 is realized by opening equal access to formal financial services, especially for young age groups who previously had the lowest inclusion index. Thus, this activity answers learning needs and contributes to more inclusive and sustainable economic development.

CONCLUSION

This community service successfully addressed the low financial inclusion index among 15–17 years old Gen Z students at SMAN 6 and SMAN 15 Surabaya. Observations and needs analysis revealed that limited interactive learning resources and conventional methods hindered students' understanding of economic concepts. By integrating interactive flipbooks, contextual learning, and hands-on digital payment practices, students' financial literacy and inclusion improved significantly. It is recommended that digital teaching materials be regularly updated and integrated into the national curriculum. Strengthening collaboration between schools and financial institutions, along with teacher training in digital and contextual pedagogy, is essential. This model should be replicated in other schools to accelerate youth financial inclusion nationwide. Based on the activity results, it is recommended that digital teaching materials such as interactive flipbooks be updated regularly to keep up with the development of financial technology and systematically integrated into the national curriculum. In addition, collaboration between schools and financial institutions such as Bank Indonesia and partner banks needs to be strengthened to expand the socialization and direct practice of digital

financial services for students. Teachers also need to be given intensive training related to the development of teaching materials and digital learning media, as well as combining them with contextual learning methods, so that they can adapt teaching strategies to the characteristics of Gen Z. Furthermore, this model of monitoring activities is recommended to be replicated in other schools to support the acceleration of achieving national financial inclusion targets, especially among the younger generation.

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AUTHOR CONTRIBUTIONS

Endah Nur Amalina: Conceptualization, Writing – Original Draft, and Project Administration; **Erni Astriani:** Conceptualization and Investigation; **Nashru Aji Jawanoko:** Investigation and Writing – Review and Editing; **Qory Afdhila:** Investigation and Resources; **Titis Dwi Prastika:** Visualization and Investigation; **Triska Aulia Fibranti:** Methodology and Resources; **Wahyu Putri Lestari:** Data Curation and Visualization; **Yunika Nurfadilla:** Methodology and Data Curation; **Zhazha Zahira Ginastuti:** Funding Acquisition and Formal Analysis; **Muhammad Abdul Ghofur:** Validation and Supervision; and **Ermita Yusida:** Validation and Supervision. All authors have read and approved the final version of this manuscript.

DECLARATION OF COMPETING INTEREST **1**

In connection with this manuscript, we declare that no known financial conflicts of interest or personal relationships could have influenced the objectivity, integrity, or outcomes of the research and community service activities reported herein. This statement affirms the transparency and ethical standards upheld throughout the preparation and execution of this work.

DECLARATION OF ETHICS **1**

The authors declare that this manuscript's research and writing adhere to established ethical standards of research and publication. All processes were conducted following accepted scientific principles, and the manuscript is guaranteed to be free from any form of plagiarism.

DECLARATION OF ASSISTIVE TECHNOLOGIES IN THE WRITING PROCESS

The authors declare that generative artificial intelligence (Gen AI) and other AI-assisted tools were used prudently, not excessively, during the research and preparation of this manuscript. Specifically, ChatGPT was used for brainstorming ideas; Grammarly for grammar and style correction; and Scopus AI for finding credible references. All AI-generated material was reviewed and edited for accuracy, completeness, and compliance with ethical and scholarly standards. The authors accept full responsibility for the final content of the manuscript.

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