

Improving Digital Safety and Ethical Awareness through Community Service Initiatives in Educational Environments

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ABSTRACT

This study presents the outcomes of a community service initiative conducted by Informatics Engineering students of UIN Jakarta, focusing on the enhancement of digital literacy particularly digital safety and digital ethics within the cultural context of Indonesian educational institutions. The program engaged nine schools across Jakarta, Tangerang City, South Tangerang, and Bogor, regions characterized by diverse educational and socio-cultural backgrounds. Emphasizing culturally sensitive approaches to digital interaction, the program provided participants with knowledge and ethical frameworks aligned with local values and community norms. Post-program evaluations revealed a marked increase in digital literacy, with an average score of 4.28 on a 5-point scale. Furthermore, 47.1% of participants rated the module on data security at the highest level. However, cultural barriers were also identified, including hesitancy from some institutions to adopt formal digital supervision structures, often due to traditional perceptions of trust and authority. Despite these challenges, the initiative proved effective in cultivating culturally-aware digital behavior, preparing participants to navigate the digital era while remaining rooted in local ethical standards.

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1. INTRODUCTION

The rapid development of information and communication technology has significantly reshaped the social and educational landscape in Indonesia (Asviyati et al., 2023). According to the 2024 Indonesian Internet Penetration Survey conducted by APJII, there are 221.5 million internet users across the country, based on responses from 8,720 individuals. The majority of users are from Generation Z (34.4%), Millennials (30.62%), and Generation X (18.98%), with the highest penetration rate recorded among Millennials (93.17%), followed by Generation Z (87.02%) and Generation X (83.69%). This widespread adoption of digital technology among young generations reflects their high level of autonomy and skill in accessing digital content (Skare & Riberio Soriano, 2021). However, it also introduces significant risks, especially in terms of digital security and ethical behavior online, due to insufficient supervision and guidance (Surdu et al., 2021).

Therefore, it is crucial for parents, educators, and policymakers to prioritize digital literacy education and promote responsible online behavior among younger generations (Mardiah Hamzah et al., 2023). This will help mitigate potential dangers and ensure a safer digital environment for all users. By equipping young people with the necessary knowledge and skills to navigate the digital world responsibly, we can empower them to make informed decisions and protect themselves from online threats (Hermawan et al., 2023; Sousa & Wilks, 2018; Sugiarto & Farid, 2023). Additionally, fostering open communication and establishing clear guidelines for online behavior can further support the development of a safer digital community (Zada et al., 2020).

The Programme for International Student Assessment (PISA) 2022 further illustrates the challenges in digital competence. Indonesia ranked 69th out of 80 participating countries, with an overall score of 1108, including 366 in Mathematics, 383 in science, and 359 in Reading. These results highlight a critical gap in Indonesian students' ability to analyze and evaluate information critically, an essential component of digital literacy in the 21st century. This deficiency not only impedes their academic progress but also exposes them to various online risks and challenges in an increasingly digital world (Facer, 2011; Rikel & Starostina, 2023; Surdu et al., 2021).

Digital literacy has emerged as a key concept in addressing these challenges (Xiao & Zhao, 2021). Being digitally literate means more than just technical know-how it requires the ability to access, evaluate, and use information effectively and ethically. Lazonder found a positive correlation between students' digital literacy and their reading comprehension and mathematical reasoning (Lazonder et al., 2020), indicating that enhancing digital literacy may also contribute to broader educational outcomes. Efforts have been made to improve digital competence in schools, including the digitalization of textbooks and the integration of information technology in classrooms (Brown, 2014). However, most existing initiatives focus primarily on technical skills rather than ethical awareness and digital safety.

Several previous programs have attempted to bridge this gap, yet they often lacked cultural contextualization, sustainable implementation strategies, or engagement with institutional policy-making. While these initiatives have yielded positive short-term outcomes, they frequently fall short in fostering long-term behavioral change or building institutional frameworks for digital ethics and data protection. Moreover, limited collaboration between higher education institutions and schools has reduced the potential scalability and impact of such programs.

To address these limitations, this study proposes a culturally contextualized, school-targeted community service program initiated by the Informatics Engineering Study Program at UIN Syarif Hidayatullah Jakarta. This initiative is distinguished by its dual focus on digital safety and digital ethics, aiming to promote awareness, behavioral change, and institutional readiness through a combination of seminars, focus group discussions, and interactive training. Unlike earlier efforts, this program integrates local cultural values and encourages institutional commitment to sustainable digital literacy policies.

The objective of this work is to evaluate the effectiveness of this community service program in enhancing students' and teachers' understanding of digital safety and ethics, while also encouraging educational institutions to adopt long-term digital literacy frameworks tailored to Indonesia's socio-cultural context.

2. METHODS

This study applies a quantitative approach to systematically and measurably identify and analyze the relationships among the variables under investigation. Through this approach, the researcher can uncover patterns and general principles that apply to the phenomena being studied (Pitman, 1998), allowing the results to potentially be generalized to broader contexts. As (Fink, 2009) asserts, this study employs a survey method, which is a form of quantitative research designed to provide a comprehensive overview of specific aspects of the population under study. The survey method was selected for its ability to collect data comprehensively from a group of respondents, making the results generalizable to a larger population (Fitriyani et al., 2020).

2.1. Participant (Subject) Characteristic

The participants in this study were students and teachers from nine educational institutions located in four regions: Bogor Regency, South Tangerang City, Tangerang City, and South Jakarta. These institutions included both junior high and senior high schools, as well as Islamic schools. The total sample size was 66 respondents.

- a. SMPN 3 Tangsel and SMAN 8 Tangsel had the highest number of participants, with 16 respondents each.
- b. Darul Muttaqien (RA Teachers) contributed 15 respondents.
- c. MAN 2 Tangerang City provided 7 respondents.
- d. SD Islam Al-Taqwa had four respondents.
- e. SMP Al-Mubarak, SMPN 110 Jakarta, and SMPN 189 Jakarta each had three respondents.
- f. The smallest contribution came from MA Daarul Hikmah, with only 1 respondent.

The diverse participant pool was selected to ensure representation across different educational levels, institutions, and regions, providing a broad perspective on the effectiveness of the Digital Literacy Community Service Program.

2.2. Research Design

The research design adopted in this study was descriptive and cross-sectional, focusing on the assessment of the program's immediate impact. The design was selected to describe the current state of digital literacy and the program's effectiveness at the time of the intervention. It was also

intended to evaluate how well the program could increase awareness and knowledge of digital safety and ethics within the given sample of students and teachers.

The cross-sectional design allowed the researchers to capture data from participants at a single point in time, providing an immediate snapshot of the impact of the program. This approach was suitable for the evaluation of a community service program, as it provides actionable insights that can inform future educational interventions.

2.3. Procedures and Intervention Delivery

The study involved a community-based intervention program aimed at enhancing digital literacy, particularly in the domains of digital safety and ethics. The intervention was delivered through a combination of lectures, seminars, focus group discussions, and interactive workshops. These activities were designed to educate both students and teachers on topics such as personal data protection, recognizing and avoiding digital threats, and adhering to ethical behavior while navigating online spaces.

The intervention was conducted over the course of several weeks, with each participating institution hosting a series of tailored workshops and seminars. The program content was aligned with existing digital literacy frameworks to ensure its relevance to the target participants and their educational contexts.

2.4. Sampling Procedures and Sample Size

Participants were selected using non-probability convenience sampling, ensuring that the institutions involved were easily accessible and willing to participate in the program. While the sampling method was non-random, the selection aimed to cover a broad spectrum of educational backgrounds and geographical areas, providing a comprehensive view of the program's effectiveness across diverse settings. The final sample consisted of 66 respondents, which was deemed sufficient to provide a preliminary assessment of the program's impact.

2.5. Measurement Approach

Data were collected using a Google Form questionnaire, which was designed to measure participants' attitudes, knowledge, and behaviors related to digital safety and digital ethics. The questionnaire included a series of Likert-scale items (ranging from “strongly agree” to “strongly disagree”) to assess participants' understanding and attitudes before and after the intervention.

The psychometric properties of the questionnaire were evaluated for reliability and validity. The scale items were adapted from established frameworks on digital literacy and online behavior by Lazonder. The form's design allowed for efficient and scalable data collection, ensuring that responses could be easily analyzed despite the geographic spread of participants.

2.6. Data Analysis

Descriptive statistics were applied to the collected data to provide an overall picture of participants' attitudes and behaviors regarding digital literacy. The analysis focused on measuring pre- and post-intervention changes in understanding of digital safety and ethics. The Likert-scale responses were analyzed to determine trends and patterns in digital literacy, identifying areas of

improvement and potential gaps in the program’s delivery. The results were also used to inform recommendations for future iterations of the program.

3. RESULTS AND DISCUSSION

Before the implementation of the digital literacy community service program, an analysis was conducted to assess the current state of digital literacy awareness, policies, and practices across the participating institutions. This included a survey targeting educators and administrative staff from MAN 2 Kota Tangerang, SD Islam Al-Taqwa, SMP Al-Mubarak, SMPN 110 Jakarta, and SMPN 189 Jakarta. The goal was to identify gaps in knowledge, existing policies, and the practical application of digital literacy concepts. Table 1 describe the demography of our respondent in this community service program.

Table 1. Respondent Demography

Sex	Total	Percentage (%)	Living Area	Total	Percentage (%)
Male	34	47,22%	South Tangerang	44	61,11%
Female	38	52,78%	Tangerang (City)	7	9,72%
			Bogor	15	20,83%
			Jakarta	6	8,33%
Occupation	Total	Percentage (%)			
Student	42	58,33%			
Teacher/Staff	30	41,67%			

The demographic data shows that the majority of the 72 respondents are female (52.78%) and students (58.33%), with the remaining 47.22% being male and 41.67% working as school staff or teachers. Geographically, most participants are from South Tangerang (61.11%), followed by Bogor (20.83%), Tangerang City (9.72%), and Jakarta (8.33%). This indicates that the respondents are predominantly young, female, and based in the South Tangerang area, reflecting a strong engagement from the student community in that region. Figure 1 describe the initial finding about the respondent background on digital literacy understanding.

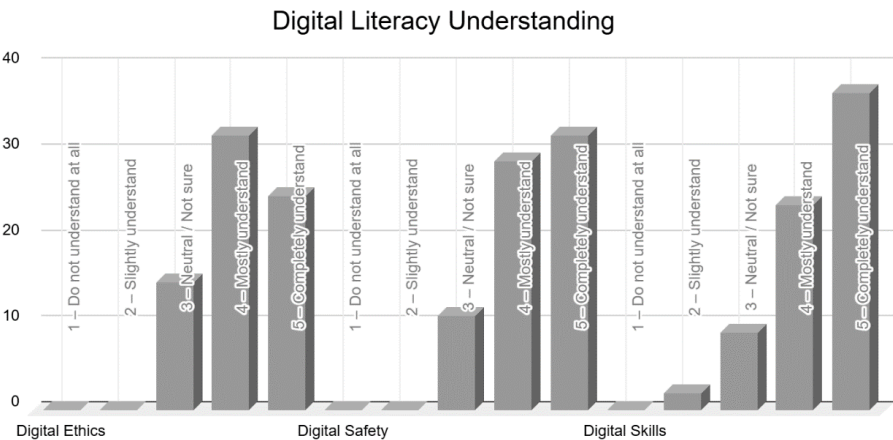


Figure 1. Digital Literacy Understanding diagram

Based on the result about digital literacy understanding, participants demonstrated a reasonable understanding of digital literacy, with an average score of 3.93 out of 5, indicating that they were familiar with its basic concepts. However, this understanding varied across institutions, with some reporting that digital literacy was not consistently integrated into the curriculum or educational activities. This highlights the need for more structured and widespread implementation.

On the Institutional Digital Policies, many of the institutions had policies or Standard Operating Procedures (SOPs) related to digital learning, reflected by an average score of 3.88. Despite this, not all policies were fully operational or effectively utilized. The lack of a systematic approach to digital literacy implementation pointed to a need for more comprehensive and active policy enforcement. In terms of digital safety and ethics, respondents exhibited a solid understanding, with average scores of 4.03 and 4.12, respectively. While the knowledge was present, the practical application of these concepts in daily activities was not as robust, with a lower score of 3.81 indicating a disconnect between awareness and real-world implementation.

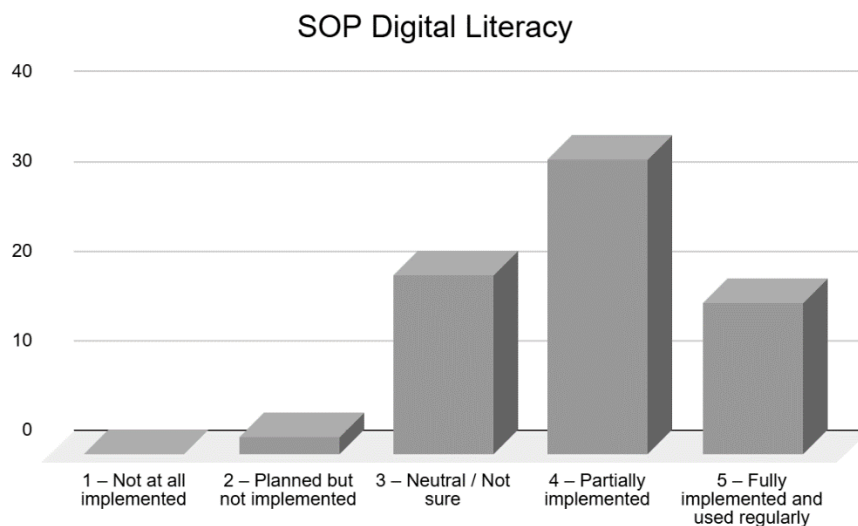


Figure 2. *Digital Literacy Standard Operating Procedures (SOP) in the institution*

Regarding digital skills, most respondents fell into the intermediate proficiency category (47.1%), while 32.4% were highly skilled, and 20.6% had only a basic understanding. This distribution suggested that while there was a reasonable baseline of digital competence, further skill development was necessary to ensure broader and more effective engagement with digital technologies. This pre-condition analysis highlighted the existing gaps in digital literacy knowledge, the inconsistent implementation of policies, and the need for further skill development. These findings served as the foundation for tailoring the digital literacy program to address these gaps and improve both theoretical understanding and practical application across the participating institutions.

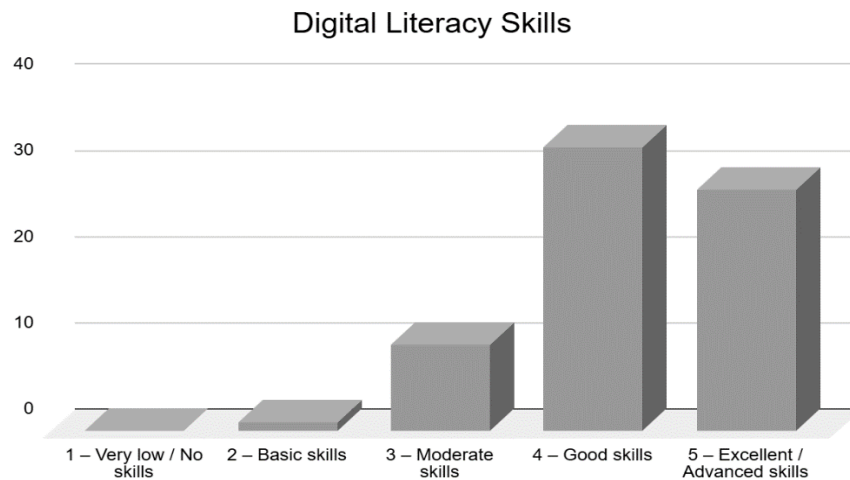


Figure 3. *Digital Literacy Skills*

3.1. Impact of the Program on Institutional Aspects

The Digital Literacy Community Service Program, focusing on digital safety and digital ethics, has had a noticeable impact on the participating institutions. The program was evaluated based on several key aspects, including the perceived benefits, improvements in digital understanding, data security skills, technology utilization, program sustainability, and the monitoring of digital activities. By Perceived Benefits of the Program, the majority of institutions reported clear benefits from the program, with an average score of 4.16 out of 5. This indicates that the institutions found the program helpful in enhancing digital literacy, particularly in fostering an understanding of digital safety and ethics. Participants expressed that the program added value to their institutional practices and knowledge, contributing to the overall improvement of digital education within their environment.

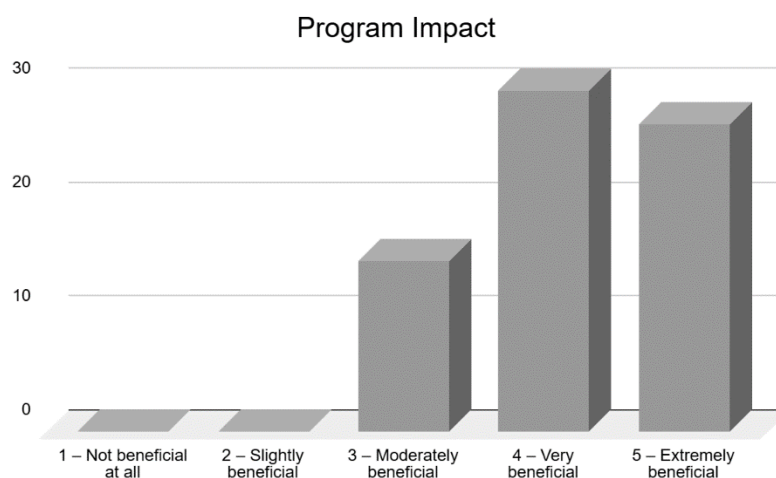


Figure 4. *Digital Literacy diagram impact*

The program led to a significant improvement in institutions' understanding of digital literacy. Respondents reported an increase in knowledge across the three main components: digital ethics, digital safety, and digital skills. Most institutions indicated that the training had a positive effect on their understanding, with many giving the highest score of 5, signaling substantial progress in these areas.

In terms of data security, institutions also saw a notable improvement. The average score of 4.0 suggests that the program effectively increased participants' awareness and abilities regarding the safeguarding of personal and institutional data. This result highlights the program's success in addressing the importance of digital security and equipping institutions with the necessary skills to implement stronger protective measures.

The program also contributed to a higher level of readiness in institutions to incorporate technology into learning and administrative functions. With an average score of 4.15, this suggests that most institutions are now more prepared to apply digital tools in educational and operational settings, enhancing both teaching and institutional performance.

Institutions expressed strong support for the continued implementation of digital literacy initiatives. An average score of 4.13 indicates a broad willingness among institutions to sustain and further develop digital literacy programs. This suggests a positive outlook for the long-term impact of the program and its potential to become an integral part of institutional curricula and policies.

Despite the positive outcomes, institutions were more hesitant about establishing dedicated teams to monitor digital activities. The average score of 3.0 suggests that while there is an awareness of the importance of monitoring digital practices, not all institutions are ready or equipped to set up specialized teams for this task. This reflects a need for further support and capacity-building in this area.

Overall, the program had a significant positive impact on the institutions, improving their digital literacy practices and laying the groundwork for ongoing digital education efforts. However, the formation of dedicated monitoring teams requires more focus and development to ensure comprehensive digital governance.

CONCLUSION

The Community Service Program on Digital Literacy, emphasizing digital safety and digital ethics, has demonstrated significant effectiveness in enhancing participants' digital competencies while remaining culturally grounded within the educational community. Evaluation data revealed a high level of participant satisfaction, with an average score of 4.41 out of 5, indicating the program's strong alignment with both technological and socio-cultural needs.

Substantial improvements were recorded across three key areas of digital literacy. Understanding of digital ethics remained steady, reflecting participants' awareness of moral responsibilities in the digital realm. Comprehension of digital safety improved from 4.12 to 4.29, indicating greater awareness of protecting oneself and others in digital spaces. The most remarkable advancement occurred in digital skills, with the majority of participants giving the highest score of 5—showing that practical, skill-based learning resonated effectively with local values of self-reliance and adaptability.

The cultural impact was also reflected in participants' intentions to integrate their digital knowledge into daily life. Between 36.8% and 48.5% expressed a strong commitment to applying digital literacy within their personal, educational, and community settings. Particularly in managing personal digital security, 38.2% to 47.1% reported enhanced abilities—aligning with cultural values of responsibility and mutual protection. The positive uptake in using information technology for learning and productivity, with dominant scores of 4, illustrates how the program supported a balanced integration of modern skills within traditional community norms.

Institutional enthusiasm for sustaining the program was evident, with an average interest score of 4.13. This reflects the collective cultural drive within educational institutions to foster digital empowerment as part of their long-term development agenda. The strong institutional support suggests great potential for replicating and expanding culturally adaptive digital literacy initiatives in the future.

In conclusion, the program not only succeeded in boosting digital literacy but also respected and reinforced local cultural values. The improvement in digital safety, ethics, and skills—rooted in a community-based and culturally sensitive approach—forms a resilient foundation for cultivating a sustainable digital literacy culture across educational and societal contexts.

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