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Integration of Teachers' Technological Competence on Enhancing Students' Digital Literacy

Melda Rumia Rosmery Simorangkir[1*], Melya Dyanasari Sebayang[2]

[1,2]Universitas Kristen Indonesia, Indonesia

ABSTRACT: The growth of social media users in Indonesia has shown a significant increase, reaching 26% annually, with a total of 180 million users or equivalent to 62.9% of the total population. This study aims to analyze the integration of teachers' technological competence in enhancing students' digital literacy at the junior high school level, particularly at Tunas Utama Junior High School, Karawang. This research employs a qualitative method with a phenomenological approach to gain an in-depth understanding of teachers' experiences and practices in integrating technology into learning. Data collection techniques include in-depth interviews, Focus Group Discussions (FGDs), and observations. The data were analyzed inductively through data reduction, data display, and conclusion drawing. The findings indicate that the integration of teachers' technological competence has been implemented relatively well, as evidenced by the utilization of various digital platforms in learning and the availability of adequate supporting infrastructure. However, limitations remain in aspects such as digital collaboration, ethical use of technology, and information security.

KEYWORDS: Competence, Technology, Digital Literacy, Students

INTRODUCTION

The 2025 report by We Are Social indicates a significant increase in social media usage in Indonesia. The number of social media user identities grew by 26% annually, reaching 180 million users, or equivalent to 62.9% of the total population. Social networking platforms remain the most widely accessed type of digital service, followed by messaging and communication applications, emphasizing the importance of social interaction in the digital lives of Indonesian society. Indonesians also spend a considerable amount of time on social media, averaging approximately 21 hours and 50 minutes per week, including time spent watching online videos. This duration is equivalent to more than three hours of daily usage. Furthermore, users access an average of 7.7 social media platforms each month, indicating that Indonesia's social media ecosystem is diverse and dynamic, although relatively fragmented. In line with the findings of We Are Social (2025), data from the Indonesian Internet Service Providers Association indicate that the number of internet users in Indonesia in 2025 reached approximately 229 million people. This figure has increased compared to the previous year, with internet penetration rising from 79.50% in 2024 to 80.66% in 2025. This growth suggests that access to digital technology is becoming increasingly widespread and has become an integral part of everyday life. However, digital literacy should not be limited to the ability to use technological devices in daily activities. According to the Directorate of Elementary Schools (2021), digital literacy is one of the six fundamental literacies that must be mastered by students in the modern era. These include reading and writing literacy, scientific literacy, numeracy literacy, digital literacy, financial literacy, as well as cultural and civic literacy. This highlights the strategic role of digital literacy in fostering critical, creative, and adaptive thinking skills in response to rapid technological advancements.

Amid the era of disruption marked by the acceleration of technological transformation, the flow of digital information has developed rapidly and massively. Social media, as one of the primary means of communication, has further accelerated the distribution of information, including the spread of unverified news or hoaxes (Tsaniyah & Juliana, 2019). This condition presents increasingly complex challenges for society, particularly for younger generations, in filtering, understanding, and evaluating the information they receive. Therefore, digital literacy has become a fundamental necessity, not only limited to technical skills in using digital devices but also encompassing critical, ethical, and responsible thinking in utilizing information within digital spaces.

In line with these developments, many developed countries have positioned information and communication technology (ICT) as a crucial component of primary and secondary education systems. The integration of digital competencies into curricula is implemented comprehensively across educational levels, enabling students to become accustomed to using technology as part of essential 21st-century skills (Riska, Rosmilawati, & Juansah, 2025). Support for internet access, both in schools and at home, is a key factor in facilitating digital-based learning processes. Digital education is viewed as a dynamic and continuously evolving field,

as the emergence of new technological innovations presents both opportunities and challenges for educators in adapting learning strategies to meet contemporary demands (Sinaga & Firmansyah, 2024).

Teachers' digital literacy plays a crucial role in determining the quality of classroom learning. In practice, there is still a tendency among teachers to use unverified internet sources as teaching materials, often due to limitations in critically selecting and evaluating information (Diputra, Tristiantari, & Jayanta, 2020). In fact, strong digital literacy is essential for educators to effectively access, manage, and utilize credible learning resources. On the other hand, the use of digital technology is also associated with various negative impacts. Exposure to inappropriate content, such as violence, pornography, human trafficking, and cyberbullying, poses real threats in digital environments (Mazdalifah & Sitepu, 2018). Additionally, uncontrolled use of digital media may contribute to the degradation of moral values among adolescents, as reflected in behavioral patterns, fashion styles, and language use that tend to imitate public figures without adequate value filtering (Kurniawan et al., 2023).

Digital literacy refers to an individual's ability to effectively utilize digital technologies, including the skills to access, understand, evaluate, and communicate information through various digital devices and platforms (Rahmawati & Artikel, 2023; Jannah, Maulana, & Khairunnisa, 2024). The level of digital literacy is influenced not only by individual factors but also by supporting aspects such as access to technology, quality of education, teachers' technological proficiency, family environment support, and government policies in promoting digital literacy within educational institutions. Strengthening digital literacy is not solely the responsibility of students but also of educators as the primary facilitators of learning. Educators are required to possess adequate digital competence to guide students in using technology wisely, critically, and responsibly, while minimizing the negative impacts of digital media use (Sitompul, 2022; Surya et al., 2025).

In the educational context, teachers play a strategic role as facilitators and learning agents who guide students in the appropriate and responsible use of technology. Therefore, the integration of teachers' technological competence into the learning process becomes a key factor in enhancing students' digital literacy. This competence encompasses not only technical skills in operating digital tools but also pedagogical abilities in integrating technology into effective and meaningful learning strategies. Based on this importance, this study aims to analyze the integration of teachers' technological competence in improving students' digital literacy at the junior secondary education level. Furthermore, this study examines various programs and strategies implemented by teachers to develop students' digital literacy, particularly at Tunas Utama Junior High School, West Karawang. Thus, this research is expected to provide empirical insights into the role of teachers' technological competence in supporting the strengthening of students' digital literacy within the educational environment.

RESEARCH METHOD

This study employs a qualitative method with a phenomenological approach. This approach was selected to gain an in-depth understanding of the meaning of individuals' and groups' lived experiences related to the phenomenon under investigation. The phenomenological method enables researchers to describe and analyze phenomena, events, social activities, attitudes, beliefs, perceptions, and thoughts of research subjects comprehensively (Sugiyono, 2010). According to Moleong (2018), qualitative research is used to examine natural conditions of objects, where the researcher acts as the key instrument. Data collection and analysis are conducted inductively, emphasizing the interpretation of meaning rather than generalization. Therefore, this approach is considered appropriate for exploring deeply the experiences, perspectives, and interpretations of informants within the studied context.

Data collection techniques in this study include open-ended interviews, Focus Group Discussions (FGDs), and observations. Open-ended interviews were conducted to obtain an initial overview of informants' perceptions and experiences, while FGDs were used to explore information more deeply through interaction and discussion among participants. Observations were carried out to obtain contextual data regarding actual practices in the field. Informants were selected using purposive sampling, a technique based on specific considerations relevant to the research objectives. The selected informants were considered to possess sufficient knowledge, experience, and direct involvement with the studied phenomenon, enabling them to provide rich and meaningful information.

The collected data were analyzed qualitatively through stages of data reduction, data display, and conclusion drawing. To ensure data validity, this study employed source and method triangulation, as well as member checking with informants to confirm the consistency between the collected data and actual field conditions.

RESULTS AND DISCUSSION

Digital Literacy Infrastructure

The findings indicate that Tunas Utama Junior High School, Karawang, possesses relatively adequate digital literacy infrastructure designed to support the development of both teachers' and students' digital competencies. The availability of such infrastructure serves as a crucial factor in the implementation of digital literacy, as it provides a fundamental foundation for building students' understanding and skills in responding to the demands of the digital era. In general, the existing facilities are capable of supporting technology-based learning processes. The school is equipped with 35 computer units, all of which are supported by relatively stable

internet access and are available for student use. This number is considered sufficient as it meets the school's quality standards, representing approximately 30% of the total student population. This condition enables the implementation of digital-based learning in a rotational or scheduled manner.

In addition, the school provides access to digital learning resources, such as e-books available in the library. Further support is evident in the use of digital platforms such as the Merdeka Mengajar Platform and belajar.id accounts, which provide access to a wide range of interactive learning materials. This reflects the school's effort to integrate technology more broadly into the learning process. However, the findings also reveal several limitations, particularly related to infrastructure that supports digital collaboration. The available facilities have not fully supported technology-based collaborative learning activities, such as student digital projects. Although teachers have begun to develop digital-based teaching modules, student engagement in digital project-based activities remains suboptimal.

This condition indicates that the integration of technology in learning is still at an early stage, primarily focused on using technology as a medium for content delivery rather than on fostering 21st-century skills such as collaboration, creativity, and digital problem-solving. Therefore, strengthening infrastructure and adopting more innovative learning strategies are necessary to ensure that students' digital literacy develops more comprehensively.

Teachers' Digital Skills Competence

The findings reveal that teachers at Tunas Utama Junior High School, Karawang, demonstrate a relatively strong level of professional competence in digital technology skills. This competence is a crucial aspect in supporting the integration of technology into the learning process, thereby enhancing both learning effectiveness and student engagement. Teachers' digital literacy enables them to understand and utilize various hardware and software commonly used within the school environment. In practice, teachers have demonstrated the ability to use a variety of digital applications and learning platforms. This is reflected in their use of tools such as Zoom or Google Meet for online learning, Google Classroom for digital classroom management, and the Merdeka Mengajar Platform (PMM) for instructional development.

Furthermore, teachers actively use email, develop PowerPoint-based presentations, and utilize cloud-based storage such as Google Drive. Their ownership of social media accounts and active engagement in sharing best practices through these platforms also indicate efforts to build professional networks and disseminate innovative teaching practices. The use of supporting devices such as USB drives and other digital storage tools further strengthens teachers' ability to manage learning resources flexibly.

The findings also indicate that teachers have begun to integrate technology into the curriculum and instructional methods. Technology is not only used as a tool for delivering content but has also started to support more interactive learning processes. Teachers demonstrate skills in developing digital learning materials, including the creation of instructional videos, the use of interactive presentation media, and the utilization of various digital learning resources.

However, this study also identifies several weaknesses that require attention. Based on the results of the Focus Group Discussions (FGDs), teachers' understanding of digital security and ethical aspects of technology use remains limited. Teachers have not optimally incorporated essential principles such as personal data protection, copyright awareness, ethical online communication, and safe and responsible digital behavior into their teaching practices. In addition, teachers have not systematically guided students in evaluating information authenticity, managing digital resources, and developing critical thinking skills when accessing information in digital environments.

These limitations suggest that teachers' digital skills are still largely focused on technical and operational aspects and have not fully addressed broader dimensions of digital literacy, such as ethics, security, and information literacy. Therefore, there is a need for structured and continuous professional development programs to strengthen these competencies. The role of school leadership is particularly important in encouraging teachers' professional growth, especially in enhancing adaptive digital literacy competencies in response to technological advancements. Thus, although teachers' digital technology skills at Tunas Utama Junior High School can be categorized as good, further improvement is needed in more comprehensive aspects of digital literacy to optimally support the development of students' digital competencies.

Teachers' Technological Competence

According to the National Education Standards, Article 28 paragraph (3) sub-point (c), teachers' professional competence includes the ability to master subject matter both broadly and deeply, as well as the ability to develop professionalism through reflective practice. In the context of 21st-century education, this competence cannot be separated from the mastery of technology and digital literacy as integral components of teacher professionalism. Mastery of subject matter is not merely understood as content knowledge but also as the ability to design and deliver learning effectively through the utilization of technology. Digital literacy becomes a crucial component in this regard, as it encompasses the ability to access, understand, evaluate, create, and communicate information in a critical, creative, and reflective manner. Thus, the relationship between digital literacy and teachers' professional competence is highly significant, particularly in addressing the demands of learning in the digital era.

Teachers are required not only to use technology as a supporting tool but also to integrate it pedagogically to develop students' 21st-century skills, such as creativity, innovation, communication, collaboration, critical thinking, problem-solving, and decision-making.

This highlights that teachers' technological competence is an inseparable part of efforts to improve the quality of learning. To measure the level of digital literacy, this study employed a questionnaire distributed to teachers and students via Google Forms, with data analysis conducted using the JASP application. The questionnaire was designed to identify the achievement of digital competence based on several key indicators: (1) information and data literacy, (2) critical thinking skills, (3) communication skills, (4) ethics in technology use, (5) personal security, (6) device security, and (7) technological skills.

The measurement results indicate that, in general, teachers demonstrate a relatively good level of competence in the use of technology and digital communication. Teachers are capable of utilizing various digital tools and platforms to support the learning process. However, in several indicators—such as digital ethics, information security, and data literacy—limitations in understanding and implementation are still evident. These findings suggest that teachers' technological competence remains predominantly focused on technical-operational aspects and has not fully encompassed broader dimensions of digital literacy. In fact, aspects such as ethics, security, and critical thinking in managing digital information are essential components in developing comprehensive digital literacy for both teachers and students. Therefore, strengthening efforts are required through continuous professional development programs that focus not only on technology use but also on the holistic development of digital literacy. Such efforts are expected to enhance teachers' professional quality while supporting the creation of innovative, adaptive, and contextually relevant learning environments.

CONCLUSION

The findings of this study conclude that the integration of teachers' technological competence in enhancing students' digital literacy at Tunas Utama Junior High School, Karawang, has demonstrated relatively positive outcomes. However, further strengthening is required in several strategic aspects to align with national policy directions, particularly the National Literacy Movement (Gerakan Literasi Nasional/GLN) and the School Literacy Movement (Gerakan Literasi Sekolah/GLS).

First, in terms of digital literacy infrastructure, the school has relatively adequate facilities, including the availability of computer devices, internet access, and digital learning resources. These infrastructures serve as a fundamental basis for supporting the implementation of digital literacy as part of strengthening the GLS. However, limitations in infrastructure supporting digital collaboration indicate that the use of technology has not fully shifted toward interactive and project-based learning, as expected within the GLN framework that emphasizes 21st-century skills.

Second, in terms of digital usage skills, teachers have demonstrated a relatively good ability to utilize various digital learning platforms such as Google Classroom, Zoom/Google Meet, and the Merdeka Mengajar Platform. This indicates that technology integration has begun to support digital literacy-based learning processes in schools. Nevertheless, such utilization still tends to focus on technical-operational aspects and has not fully developed more comprehensive dimensions of digital literacy, such as digital ethics, information security, and critical literacy, which are essential components in the implementation of GLS based on digital literacy (Redhana, 2024; Fatmawati, 2025).

Third, in terms of teachers' technological competence, the findings indicate that teachers possess sufficient competence in integrating technology into learning. However, gaps remain in several key indicators, such as data literacy, digital security, and the ability to guide students in using technology critically and responsibly. This condition suggests that the integration of teachers' technological competence has not yet been fully optimal in supporting the holistic development of students' digital literacy, as mandated by the GLN program.

Overall, the integration of teachers' technological competence at Tunas Utama Junior High School, Karawang, has contributed positively to improving students' digital literacy, particularly in terms of access to and use of technology. However, to achieve more comprehensive digital literacy outcomes in accordance with the GLN and GLS frameworks, continuous strengthening efforts are required. These include improving collaborative infrastructure, enhancing teachers' competencies through sustained professional development, and implementing digital project-based learning that fosters active engagement, creativity, and critical thinking among students.

Thus, students' digital literacy is expected not only to develop in terms of technological usage but also to encompass the ability to understand, evaluate, and utilize information wisely, ethically, and responsibly in their daily lives.

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