

Analysis of Teachers' Professional Competence in Enhancing Junior High School Students' Ability to Use Digital Literacy

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ABSTRACT

This study aims to analyze teachers' professional competence in supporting junior high school students' ability to use digital literacy effectively, critically, and responsibly as part of strengthening digital literacy in the school environment. The research employed a qualitative approach with a case study design conducted at SMP Negeri 1 Klari and SMP Tunas Utama. Informants were selected using a non-probability technique, namely purposive sampling, involving 24 participants who had direct experience and involvement in digital-based learning. Data were collected through in-depth interviews, observations, and document analysis. Data analysis was carried out through data reduction, data presentation, and conclusion drawing, supported by triangulation to ensure data validity. The findings indicate that teachers' professional competence in digital literacy at both schools has generally developed at a fairly good level. Teachers are able to utilize digital devices and applications as supporting media in lesson planning and implementation, thereby encouraging student interaction and engagement. However, limitations remain in aspects of digital security and ethical use of technology, as well as disparities in teachers' ability to optimally integrate technology into learning. These findings highlight the importance of strengthening teachers' professional competence through continuous training and supportive school policies to optimize students' digital literacy.

Keywords: Analysis; Teachers; Professional; Competence; Enhancing; Junior High School Students; Ability; Digital Literacy.

1. Introduction

The development of digital literacy in Indonesia has shown a very significant increase, particularly among adolescents. Data from the Indonesian Internet Service Providers Association (APJII) in 2022 indicate that among adolescents aged 13–18 years, 90.61% access the internet via mobile phones, while only 9.39% use PCs or laptops. Even among junior high school students or those who have completed elementary education or equivalent (Package A), as many as 99.14% access the internet via mobile phones. Overall, internet users in this group—whether through mobile phones or PCs—reach 72.37%. This high level of internet penetration indicates that students have become an inseparable part of the digital ecosystem from an early school age.

This phenomenon is reinforced by the *We Are Social* report as of January 2023, which recorded that 212.9 million Indonesians use the internet, equivalent to 77% of the total population. However, behind this high level of internet usage, various serious problems have emerged, particularly those involving children and adolescents. The Indonesian Child Protection Commission (KPAI) database in 2020 recorded 103 reports of children as victims of online sexual crimes, 91 reports of children as victims of pornography and social media abuse, 46 reports of children as victims of cyberbullying, as well as hundreds of cases involving children as perpetrators of pornographic content possession and online bullying. In addition, the Directorate of Primary Schools (2021) reported that approximately 40% of bullying cases involving children occur in cyberspace, particularly through social media. These data indicate that the ability to use technology without adequate digital literacy has the potential to generate negative impacts on students.

Digital literacy is not merely defined as the ability to operate technological devices, but also encompasses the capacity to think critically, ethically, and responsibly in utilizing digital literacy. The Directorate of Primary Schools (2021) emphasizes that digital literacy is one of the six foundational literacies that students must master in the 21st century, alongside reading and writing literacy, scientific literacy, numeracy, financial literacy, and cultural and civic literacy. In the era of disruption, the rapid flow of digital information—including the widespread dissemination of misinformation and hoaxes—demands strong digital literacy skills so that individuals are able to filter, evaluate, and use information wisely (Tsaniyah & Juliana, 2019).

Furthermore, digital education is a field that continues to evolve alongside technological advancements, making rapid change both a challenge and an opportunity for educators (Zawacki-Richter & Jung, 2023). On the one hand, technology provides broad and flexible access to learning resources; on the other hand, it requires teachers to possess adequate digital literacy competencies. Limited digital literacy among teachers may lead to the use of learning resources that are invalid, unverified, or lack credibility in the teaching and learning process. Findings by Diputra et al. (2020) indicate that teachers often use online information without undergoing critical evaluation due to insufficient skills in searching, selecting, and verifying digital information sources. This condition not only affects the quality of instruction but also has the potential to shape students' digital literacy patterns in a less critical manner.

Digital media currently plays a highly dominant role in everyday life. digital literacy are no longer confined to technical abilities such as connecting devices or opening and saving documents, but also include competencies in communication, reading, writing, and critically processing and interpreting information in digital spaces (Luthfia et al., 2021). Among adolescents, digital literacy serves as an essential foundation enabling them to analyze, compare, and make informed decisions regarding the vast amount of information they encounter (Sumiati & Wijonarko, 2020). Therefore, digital literacy among junior high school students should be understood as the ability to use information and communication technology effectively, critically, and responsibly in searching for, evaluating, processing, and communicating information online (Johanes, Suroyo, & Budiastira, 2022).

Although various efforts to enhance digital literacy have been implemented through curriculum integration, teacher training, and the provision of technological access (Devi & Winangun, 024), their implementation at the school level remains uneven and suboptimal. One key factor that still requires serious attention is teachers' professional competence in guiding and shaping students' digital literacy skills. To date, empirical studies that specifically analyze the relationship between teachers' professional competence and students' ability to use technology—particularly in the context of *Sekolah Penggerak* at the junior high school level—remain relatively limited. This is noteworthy, given that *Sekolah Penggerak* are expected to serve as catalysts for change and models of best practice in strengthening digital literacy.

Therefore, this study is both important and relevant as it seeks to examine in depth teachers' professional competence in supporting students' digital literacy skills, particularly their ability to use technology. The findings are expected to serve as a foundation for strengthening policies and digital learning practices in junior high schools. This study aims to analyze the influence of teachers' professional competence on junior high school students'

ability to use technology effectively, critically, and responsibly as part of digital literacy development in the school environment.

1.1. Professional Competence

Professional competence is one of the core competencies that teachers must possess in carrying out their role as educators (Dudung, 2018). This competence refers to teachers' ability to master subject matter broadly and deeply, including an understanding of concepts, disciplinary structures, instructional methods, the use of technology, and pedagogical approaches that are coherent with the subject area being taught (Helmi, 2015). Such mastery is an essential prerequisite for teachers to connect learning materials with developments in science and technology as well as students' needs.

Teacher professionalism is not solely measured by technical skills such as classroom management or the use of instructional media, but is also reflected in attitudes, responsibilities, and professional behavior aligned with educational ethics. Kulshrestha and Pandey (2013) classify teachers' professional competence into three main dimensions: instructional competence related to lesson planning and implementation; organizational competence associated with classroom management and the learning environment; and evaluative competence concerning assessment and follow-up of students' learning outcomes. These three dimensions are interrelated and collectively determine the overall quality of teacher performance. Professional competence also reflects teachers' capacity to make appropriate pedagogical decisions based on instructional goals and students' needs. Jamin (2018) emphasizes that professional competence does not merely indicate the ability to perform teaching tasks, but also represents reflective thinking processes and teachers' continuous efforts to improve the quality of learning.

1.2. The Concept of Digital Literacy

Digital literacy is a concept that has evolved alongside the rapid advancement of information and communication technologies. Gilster and Glistter (1997) define digital literacy as an individual's ability to adapt to technological changes and to utilize these changes as opportunities in responding to various new possibilities that emerge through the use of the web. This definition emphasizes that digital literacy is not merely related to the technical aspects of using technology, but also encompasses cognitive abilities in understanding and meaningfully utilizing digital information.

In line with this perspective, Pratiwi and Pritanova (2017) conceptualize digital literacy as the ability to understand, analyze, assess, manage, and evaluate information through the use of digital literacy. This viewpoint highlights that digital literacy is closely associated with critical thinking skills in responding to the overwhelming flow of information in digital spaces. Digital literacy requires not only the ability to access information, but also the capacity to select and use information appropriately according to specific needs and contexts. Wardhana (2020) further adds that digital literacy reflects an individual's conscious attitude in using and managing digital facilities, including the ability to construct new knowledge and communicate effectively with others through digital media. This perspective emphasizes the affective and ethical dimensions of digital literacy, in which individuals are required to demonstrate social responsibility in every digital activity they undertake.

From the perspective of child protection and development, UNICEF (2019) defines digital literacy as an individual's ability to use information and communication technologies in ways that enable them to obtain optimal benefits while avoiding the negative impacts of digital engagement, both in their present daily lives and in the future. This definition positions digital literacy as a life skill that equips individuals to participate safely, healthily, and productively in the digital world. Davydov et al. (2020) emphasize that digital literacy is closely related to psychological and socio-psychological security, as well as ethical and legal dimensions of digital literacy use. These aspects include awareness of risks such as internet addiction and cyberbullying, as well as an understanding of the implications of digital communication and information activities, such as uploading photos and videos online (Koltay, 2011).

2. Research Method

This study employed a qualitative approach with a case study design. This approach was chosen to describe and analyze in depth various phenomena related to teachers' professional competence in supporting students' digital literacy skills. The qualitative approach enables researchers to comprehensively understand events, social activities, attitudes, beliefs, perceptions, and thoughts of research subjects—both at the individual and group levels—within the natural context in which the phenomena occur. The selection of informants was conducted using a non-probability sampling technique, namely purposive sampling. This technique was applied by considering specific criteria relevant to the research objectives, ensuring that the selected informants possessed experience, knowledge, and direct involvement related to the focus of the study (Sugiyono, 2015). Based on these criteria, a total of 24 informants were selected from SMP Negeri 1 Klari and SMP Tunas Utama, who were considered capable of providing in-depth and comprehensive information.

Data collection techniques included in-depth interviews, observations, and document analysis. The collected data were then analyzed qualitatively through the stages of data reduction, data presentation, and drawing conclusions. To ensure data validity, this study applied source and technique triangulation, thereby enhancing the credibility and trustworthiness of the research findings in addressing the research questions.

3. Results and Discussion

3.1. Teachers' Professional Competence in digital literacy

The findings indicate that teachers at SMP Negeri 1 Klari and SMP Tunas Utama generally possess professional competence in digital literacy, particularly in utilizing technology to support the teaching and learning process. This competence is reflected in teachers' ability to operate digital devices and use various applications and learning platforms as supporting media for instructional delivery. Teachers' digital literacy plays a crucial role in enabling the systematic integration of technology into learning activities, making instruction more interactive and encouraging active student engagement. Teachers' ability to use digital learning applications—such as Learning Management Systems (LMS), interactive presentation media, and online learning resources—contributes to improving the quality of lesson planning and instructional implementation. Teachers do not merely use technology as an administrative tool but also as a pedagogical medium to deliver materials, assign tasks, and facilitate student

discussions and collaboration. These findings demonstrate that teachers' professional competence in digital usage directly supports the achievement of learning objectives.

However, the study also reveals significant challenges in optimizing teachers' digital literacy. One major challenge arises from individual differences among teachers, particularly age-related factors, where older teachers tend to experience greater difficulty in adapting to rapid technological developments. This condition affects teachers' ability to integrate technology consistently and innovatively into classroom practices. In addition to individual factors, structural barriers also influence technology implementation in schools. School policies that do not fully emphasize technology integration, limited infrastructure such as unstable internet connectivity, and insufficient hardware facilities including LCD projectors and computers hinder the optimal implementation of digital-based learning. These findings suggest that the mere availability of technological resources does not automatically ensure effective utilization without adequate teacher competence and motivation.

Interviews further revealed that digital security and online ethics remain major weaknesses among teachers. Most teachers have not yet optimally understood or taught principles of digital safety to students, such as personal data protection, copyright awareness, information authenticity, and ethical behavior in digital spaces. This condition may lead students to use technology without critical awareness, making them vulnerable to misinformation and other digital risks. These findings emphasize that the development of teachers' professional competence in digital literacy should not be limited to technical aspects but must also encompass pedagogical, ethical, and digital safety dimensions.

Therefore, continuous professional development emerges as an urgent need. School principals play a strategic role in fostering institutional commitment to the sustainable development of teachers' digital competence in alignment with technological advancements and the demands of 21st-century learning. Overall, the results indicate that although teachers at SMP Negeri 1 Klari and SMP Tunas Utama possess a foundational level of professional competence in digital usage, more systematic strengthening through school policies, adequate infrastructure provision, and continuous training programs is still essential. Such reinforcement is expected to enhance teachers' digital literacy while simultaneously fostering students' ability to use technology effectively, critically, safely, and responsibly.

3.2. Digital Literacy Infrastructure

Based on observational findings, the digital literacy infrastructure at SMP Negeri 1 Klari and SMP Tunas Utama is in relatively good condition and supports the implementation of digital literacy within the school environment. The available infrastructure includes hardware such as computers and supporting devices, as well as software in the form of digital learning applications and platforms that enable teachers and students to interact actively in the digital environment. The availability of adequate infrastructure is a crucial prerequisite for digital literacy development, as without access to technology, teachers and students cannot optimally develop digital literacy. The existing digital literacy infrastructure also includes online learning platforms that function as support systems for virtual learning. Learning Management Systems (LMS), interactive platforms, and digital collaboration tools facilitate two-way communication between teachers and students in both synchronous and asynchronous learning activities. These

findings indicate that digital literacy infrastructure in both schools does not merely serve administrative purposes but also functions as a pedagogical medium that enriches students' learning experiences.

Furthermore, the availability of digital literacy infrastructure at SMP Negeri 1 Klari and SMP Tunas Utama creates a conducive learning environment for digital collaboration. The various tools and platforms available allow students to work collaboratively, share information, and develop digital communication and teamwork skills. This aligns with the demands of 21st-century learning, which emphasize collaboration, creativity, and the effective use of technology in teaching and learning processes.

In addition to supporting learning activities, the digital literacy infrastructure in both schools is also equipped with monitoring and evaluation systems that enable schools to assess the level of technology utilization in learning. Through these systems, schools can measure digital literacy progress, identify challenges, and determine areas requiring further improvement. Thus, digital literacy infrastructure functions not only as physical facilities but also as a strategic instrument in the development and evaluation of digital literacy programs at schools. From a quantitative perspective, observational results indicate that SMP Negeri 1 Klari has 150 computer units with adequate internet access for all students, while SMP Tunas Utama has 35 computer units, also supported by sufficient internet connectivity. These numbers meet the school quality standards, which require adequate technological facilities for at least 30% of the total student population. Compliance with this standard demonstrates that both schools have made efforts to provide technological facilities proportionate to learning needs.

Overall, the availability of information and communication technology infrastructure at SMP Negeri 1 Klari and SMP Tunas Utama contributes significantly to the effectiveness of learning implementation and the strengthening of students' digital literacy. Nevertheless, these findings also indicate that adequate infrastructure must be balanced with teachers' professional competence and supportive school policies to ensure optimal and sustainable technology utilization. With such support, digital literacy infrastructure can serve not only as a supporting facility but also as a key factor in improving learning quality and fostering comprehensive digital literacy among students.

4. Conclusion

Teachers' professional competence in digital literacy skills at SMP Negeri 1 Klari and SMP Tunas Utama has generally been well established. Teachers are able to utilize digital devices and applications as instructional media, both in lesson planning and in the implementation of teaching and learning activities. The use of digital literacy contributes positively to increased learning interactivity, student engagement, and the achievement of learning objectives. Teachers' digital literacy plays a critical role in integrating technology pedagogically, not merely as an administrative tool but as a meaningful learning resource.

However, the optimization of teachers' professional competence in digital literacy use still faces several challenges. Differences in individual teacher capabilities, particularly those influenced by age factors, result in variations in the level of mastery and utilization of digital literacy. In addition, structural barriers such as school policies that are not yet fully oriented toward digital-based learning, limitations and instability of internet networks, and uneven availability of hardware also affect the effectiveness of technology use in learning. Digital safety and online ethics

remain areas of weakness, as teachers have not yet optimally equipped students with adequate understanding of data protection, copyright, information authenticity, and ethical behavior in digital spaces.

From the perspective of digital literacy infrastructure, both schools possess facilities that are relatively adequate and meet school quality standards. The availability of hardware, internet access, and online learning platforms supports digital learning implementation and creates a learning environment conducive to collaboration, communication, and the development of 21st-century skills. This infrastructure also enables schools to monitor and evaluate digital literacy implementation more systematically. Overall, this study confirms that strengthening students' digital literacy depends not only on the availability of technological infrastructure but is also strongly influenced by teachers' professional competence and supportive school policies. Therefore, sustained institutional commitment is required through the provision of continuous professional development for teachers' digital competencies, the strengthening of technology-oriented policies, and the maintenance and development of digital infrastructure. These efforts are expected to enhance learning quality while equipping students with digital literacy skills that are effective, critical, safe, and responsible in facing the challenges of the digital era.

5. Suggestions for Future Research

1. Future studies are recommended to involve a wider and more diverse research sample, including schools from different regions and socio-economic backgrounds, in order to obtain a more comprehensive understanding of teachers' digital competence and its impact on students' digital literacy.
2. Further research may employ a mixed-methods approach that integrates quantitative measurement of digital competence with in-depth qualitative exploration, so that the relationship between teachers' skills, classroom practices, and student learning outcomes can be analyzed more holistically.
3. It is suggested that subsequent studies examine the effectiveness of specific professional development models for teachers, such as mentoring, peer coaching, or micro-credential programs, in improving digital pedagogical competence.
4. Future researchers are encouraged to explore students' perspectives on digital learning practices, including issues of digital safety, online ethics, and critical information literacy, to complement teachers' viewpoints.
5. Further investigation is needed to analyze the role of school leadership and policy support in sustaining digital transformation, particularly regarding infrastructure management, curriculum integration, and long-term digital literacy strategies.

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Competing Interests Statement

The authors declare no competing financial, professional, or personal interests.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

Both the authors took part in literature review, analysis and manuscript writing equally.

Availability of data and materials

Supplementary information is available from the authors upon reasonable request.

Ethical Approval

Not applicable for this study.

Informed Consent

Not applicable for this study.

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