The Influence of Teachers' Professional Competence on Students' Digital Literacy Skills in Junior High Schools in Karawang Regency

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ABSTRACT

The quality of educators in carrying out their roles is regulated by Minister of Education and Culture Regulation No. 16 of 2007 on Academic Qualification Standards and Teacher Competencies. This regulation establishes four core teacher competencies: pedagogical, personality, social, and professional competencies. This study aims to analyze the influence of teachers' professional competence on students' digital literacy skills at the junior high school level in Karawang Regency. Digital literacy refers to an individual's ability to effectively utilize digital technology, including accessing, understanding, evaluating, and communicating information through various devices and digital platforms. This study employs a qualitative method with data collection techniques including interviews, document analysis, and observations. The research was conducted at SMPN 1 Klari, East Karawang, selected due to its relevance to the study objectives. The findings indicate that teachers' professional competence plays a significant role in enhancing students' digital literacy. To address the challenges of 21st-century education, teachers are required not only to master subject matter comprehensively but also to effectively, ethically, and safely integrate digital technology into the learning process.

Keywords: Teachers' Professional Competence; Digital Literacy; Students' Skills; Junior High School; Karawang Regency; Education Quality; 21st-Century Skills; Teacher Performance; Student Achievement; Educational Technology.

1. Introduction

The quality of educators in carrying out their roles is regulated by Minister of Education and Culture Regulation No. 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies. This regulation establishes four core teacher competencies: pedagogical, personality, social, and professional competencies. These four competencies must be possessed by every educator in performing their duties and responsibilities. These competencies are inherent in educators and are reflected in their daily activities, both in interactions with students and in their professional development. According to Arqam (2019), the teaching profession demands a high level of professionalism. An educator is expected not only to deliver material accurately but also to embody character, habits, and values that serve as role models for students. Goodwin & Kosnik (2013) emphasize that being a teacher is not merely a formal position but a continuously evolving professional identity shaped by experience over time. However, the quality of education in Indonesia remains relatively low, despite education being a key factor in achieving national development goals (Saputro & Hadi, 2022).

In the rapidly evolving digital era, educators are no longer the sole source of learning for students. Technology enables students to access information easily from various sources, both domestically and internationally, through the internet (Aktar, 2018). Furthermore, there remains a perception that a good teacher is measured solely by students' academic achievements, without considering external factors such as family influence and previous teachers (Azam & Kingdon, 2015). As a result, technological proficiency has become a crucial aspect for educators to master to meet the demands of the 21st century. Liu & Liu (2015) stress that the teaching profession must evolve in line with the times, where lifelong learning is no longer confined to classrooms, educational institutions, or specific certifications.

In education, all school members play an active role in developing digital literacy. Gilster & Glister (1997) highlight that our ability to adapt to the web will significantly determine our future, making this skill increasingly important as technology and digitalization continue to advance.

Lee (2014) defines digital literacy as an individual's ability to utilize various formats of information and apply them through digital devices. Educators' digital capabilities were put to the test in 2020 when the COVID-19 pandemic struck, forcing various aspects of life, including education, to adapt to digital-based learning systems (Pertiwi, Kumala & Iswahyudi, 2021). Social restrictions mandated by the government compelled the education sector to optimize technology in the teaching and learning process.

In 2021, Katadata Insight Center (KIC), in collaboration with the Ministry of Communication and Information Technology (Kominfo), released a survey on Indonesia's digital literacy index. The results indicated that the digital literacy index in urban areas reached 52.5%, whereas in rural areas, it was lower at 49.8%. Additionally, the 2021 Digital Culture survey conducted across 34 provinces found that 18 provinces scored above the national average (3.9). Central Kalimantan recorded the highest score of 4.16 points, followed by North Kalimantan and other provinces (Kumanireng & Utomo, 2023). In implementing digital literacy in schools, principals and all school members must actively participate in self-development through various technologies and digital platforms.

According to Law No. 14 of 2005 on Teachers and Lecturers, teachers are professional educators who must possess four core competencies: pedagogical, professional, personality, and social competencies. These competencies are directly related to their responsibilities as professional educators. Thus, a competent teacher not only understands their field of expertise but is also proficient in utilizing technology as part of an innovative learning process. In the digital era, Information and Communication Technology (ICT) has rapidly developed, especially in the 21st century. Reddy, Sharma, & Chaudhary (2020) define ICT as the use of digital technology to create, distribute, collect, and manage information while enabling real-time communication. Examples of ICT technologies include instant messaging, Voice over IP (VoIP), and video conferencing, which facilitate seamless interactions.

According to a report by the Indonesian Internet Service Providers Association (APJII, 2022), the number of Indonesian residents connected to the internet in 2021 reached 210,026,769 out of a total population of 272,682, 600, meaning approximately 77.02% of the population was digitally connected. This connectivity is utilized across various sectors, including education, healthcare, tourism, social media, banking, and lifestyle.

This study aims to analyze the influence of teachers' professional competence on students' digital literacy skills at junior high schools in Karawang Regency. Digital literacy refers to an individual's ability to effectively utilize digital technology, including accessing, understanding, evaluating, and communicating information through various devices and digital platforms. The level of digital literacy in a region is influenced by several factors, such as access to digital technology, quality of education, teachers' technological proficiency, family support, and government policies promoting digital literacy in schools. Recognizing the crucial role of teachers in enhancing students' digital literacy, this study focuses on teachers' professional competence. Additionally, this study examines the strategies and programs implemented by teachers to improve students' digital literacy, particularly in junior high schools in Karawang Regency.

1.1. Study Objectives

This study aims to:

1. Analyze the influence of teachers' professional competence on students' digital literacy skills in junior high schools in Karawang Regency.

2. Identify the extent to which teachers' understanding and use of digital technology affect students' digital literacy development.

3. Assess the contribution of pedagogical, professional, personality, and social competencies to digital-based learning processes.

4. Examine the implementation of strategies and programs used by teachers to improve students' digital literacy.

5. Describe the role of teachers as facilitators and role models in shaping students' digital literacy habits.

6. Provide recommendations to enhance teachers' professional competence in addressing the demands of 21st-century technology-based education.

2. Theoretical Review

2.1. Educator Competence

Referring to the Regulation of the Minister of National Education No. 16 of 2007 on Academic Qualification Standards and Teacher Competence, there are four main competencies that serve as standards in determining the quality of education in Indonesia: pedagogical competence, personal competence, social competence, and professional competence.

1) Pedagogical Competence

Pedagogical competence refers to a teacher's ability to manage and understand students in the learning process. Teachers must master various educational theories to support student development and ensure they can actualize their potential optimally (Sukmawati, 2019).

2) Personal Competence

Personal competence reflects the character and behavior of teachers, which they consciously apply in carrying out their professional duties. Some indicators of a teacher's personality include humility, honesty, discipline, perseverance, creativity, patience, empathy, authority, and politeness. These qualities are part of an educator's identity and serve as role models for students (Lase, 2016).

3) Social Competence

Social competence includes a teacher's ability to adapt to their work environment and communicate effectively with various stakeholders, including students, fellow teachers, school principals, administrative staff, and the broader community. Teachers with good social competence can build harmonious relationships and support a conducive learning environment (Huda, 2017).

4) Professional Competence

Professional competence is related to in-depth mastery of teaching materials and the ability to manage the learning process. Teachers with professional competence must be able to (Nurtanto, 2016):

- Master the field of study and scientific methodology,

- Understand the structure and content of the subject matter,

- Utilize information and communication technology in learning,

- Develop systematic teaching materials, and

- Continuously improve the quality of learning.

2.2. Teacher Professional Competence

Professional competence refers to a teacher's ability to master teaching materials comprehensively and deeply, encompassing an understanding of concepts, structure, methodology, technology, and relevant arts within their field of study (Helmi, 2015). A professional educator is not only measured by their technical skills in using technology and managing classrooms but also by their professional behavior and attitude that support an effective learning process. According to Kulshrestha & Pandey (2013), professional competencies required for effective teaching can be categorized into three main aspects:

1) Instructional Competence, which involves the ability to design and implement learning strategies that align with students' needs and educational goals.

2) Organizational Competence, which includes skills in classroom management, creating a conducive learning environment, and systematically organizing teaching materials for better comprehension.

3) Evaluative Competence, which refers to the ability to assess students' progress and learning outcomes through various assessment methods to ensure effective learning.

Professional competence not only represents a teacher's technical ability in teaching but also reflects their level of professionalism. A professional teacher does not just know how to teach but can also adapt, develop innovative strategies, and apply appropriate approaches based on classroom learning needs and objectives (Jamin, 2018). Therefore, a teacher's professional competence must continuously evolve in response to technological advancements, curriculum demands, and student needs.

2.3. The Concept of Digital Literacy

Digital literacy refers to an individual's ability to adapt to technological changes and leverage them as opportunities to find new solutions and innovations in the digital era (Gilster & Glister, 1997). This ability includes understanding, analyzing, evaluating, managing, and assessing information obtained through digital technology (Pratiwi & Pritanova, 2017).

According to Wardhana (2020), digital literacy is not only related to technical skills but also reflects an individual's awareness of using and managing digital facilities responsibly, including in building new knowledge and

communicating effectively with others. UNICEF (2019) emphasizes that digital literacy is an individual's ability to utilize information and communication technology (ICT) in a way that allows them to maximize benefits while avoiding the negative impacts of digital engagement across various aspects of life, both now and in the future. From this perspective, digital literacy is not just about technical skills but also includes cognitive, social, and ethical aspects of digital interactions.

Davydov et al. (2020) state that digital literacy also encompasses psychological and social security aspects, including awareness of risks such as internet addiction, cyberbullying, and the consequences of online actions, such as uploading photos or videos without ethical considerations. Additionally, digital literacy includes an understanding of intellectual property rights, digital piracy, and legal violations in cyberspace. Therefore, digital literacy is not only focused on technical skills in using technology but also on understanding the legal, ethical, and social impacts of digital activities.

Koltay (2011) asserts that digital literacy includes the ability to understand and use information from various digital sources, which does not solely rely on basic literacy skills. In this context, there are four core competencies of digital literacy:

1) Internet Searching: The ability to effectively search for information using search engines and online sources.

2) Hypertext Navigation: The ability to move between interlinked information in digital formats.

3) Knowledge Assembly: The skill of collecting, organizing, and integrating information from various digital sources.

4) Content Evaluation: The ability to assess the validity, reliability, and relevance of information obtained online.

Thus, digital literacy is not just about technical proficiency in operating digital devices but also involves cognitive, ethical, legal, and social aspects of technology use. This ability is increasingly important in the digital era to ensure individuals can use technology productively, responsibly, and safely.

3. Methodology

This research employs a qualitative method, aiming to describe and analyze various phenomena, events, social activities, as well as individual and group attitudes, beliefs, perceptions, and thoughts (Sugiyono, 2010). According to Moleong (2018), qualitative research is used to explore the conditions of a scientific object in-depth, where the researcher acts as the primary instrument in the data collection process. Data analysis in qualitative research is inductive, emphasizing meaning rather than generalization. The data collection techniques in this study include interviews, document studies, and observations. This research was conducted at SMPN 1 Klari, East Karawang, selected as the research site due to its contextual relevance to the study objectives.

4. Results and Discussion

4.1. Digital Literacy Infrastructure at SMPN 1 Klari

SMPN 1 Klari has adequate digital literacy infrastructure designed to support the development of digital skills for both teachers and students. The availability of comprehensive facilities provides a strong foundation for

implementing digital literacy within the school environment. One of the key elements of digital literacy infrastructure at SMPN 1 Klari is technology access. The school has 150 computer units available for students, meeting the school's quality standards of 30% of the total student population. Additionally, the school provides stable and sufficient internet access, enabling both students and teachers to seamlessly access digital learning resources.

To support digital literacy, the school also has a digital library that allows students to access e-books and interactive learning materials through the Platform Merdeka Mengajar (PMM) and akun belajar.id. These facilities provide students with a variety of digital references that enrich their learning process. SMPN 1 Klari has also implemented collaborative digital-based learning. The school utilizes various tools and platforms that support interdisciplinary collaboration in digital projects, particularly in the Projek Penguatan Profil Pelajar Pancasila (P5). This initiative offers students opportunities to develop teamwork skills, critical thinking, and creativity within a digital environment.

Beyond physical infrastructure, the school also has a monitoring and evaluation system to assess the progress of students' and teachers' digital literacy. Regular evaluations are conducted to identify areas for improvement and to ensure the effectiveness of the digital literacy programs in place. With the availability of supportive infrastructure, SMPN 1 Klari remains committed to continuously enhancing the digital literacy skills of both students and educators, fostering a more innovative learning environment aligned with technological advancements.

4.2. Teachers' Professional Competence in Digital Literacy

Referring to National Education Standards Article 28, Paragraph (3), Subsection (c), teachers' professional competence includes a comprehensive mastery of teaching materials and the ability to develop professionalism through reflective actions. In modern education, digital literacy has become a crucial aspect in supporting educators' professional competence.

1. The Relationship between Professional Competence and Digital Literacy

A broad and in-depth mastery of teaching materials is not only limited to academic conceptual understanding but also includes the ability to utilize digital technology effectively. In the digital era, educators face challenges in integrating technology into the teaching process, which includes:

a) The ability to search, analyze, and critically evaluate information.

b) Enhancing creativity and innovation skills, particularly in designing digital-based learning experiences.

c) Using technology for communication and collaboration in the learning environment.

d) Strengthening critical thinking, problem-solving, and data-driven decision-making.

With the rapid development of technology, educators are not only required to have basic digital literacy but also to develop advanced digital skills, including the use of artificial intelligence, learning data analysis, and interactive media for teaching.

2. Questionnaire Data Analysis

To measure the extent of teachers' professional competence in digital literacy, a survey was conducted among teachers and students using Google Forms-based questionnaires, which were analyzed using JASP statistical software. The questionnaire covered seven key indicators:

a) Information and Data Literacy: Teachers' ability to access, comprehend, and process information efficiently from various digital sources.

b) Critical Thinking Skills: Teachers' ability to objectively analyze information and filter valid sources from misinformation or hoaxes.

c) Communication Skills: The use of technology to facilitate effective interactions between teachers and students, both in-person and online.

d) Ethical Use of Technology: Teachers' awareness of ethical aspects in utilizing digital resources, including copyright, privacy, and online communication norms.

e) Personal Security: Awareness of the importance of protecting personal data and teaching students safe internet practices.

f) Device Security: Teachers' readiness to maintain digital device security against cyber threats such as malware and phishing.

g) Technology Utilization Skills: Teachers' ability to operate various digital learning software and applications.

3. Key Findings and Implications

The analysis results indicate that most teachers in the studied school have a relatively high level of digital literacy, particularly in information and data literacy as well as critical thinking skills. However, some challenges still need to be addressed:

a) Ethical Use of Technology: Some teachers require further understanding of copyright laws, the legitimacy of information sources, and ethics in digital communication.

b) Digital Security: Awareness regarding the importance of personal data and device security is still suboptimal, highlighting the need for additional cybersecurity training.

c) Utilization of Technology for Collaborative Learning: While many teachers already integrate technology into their teaching, the use of digital platforms for interdisciplinary collaboration remains limited.

By addressing these challenges, educators can further enhance their digital literacy competencies, ensuring that technology is utilized effectively and ethically to improve the quality of teaching and learning.

4.3. Strategies for Enhancing Teachers' Professional Competence in Digital Literacy

Several strategic steps can be implemented to enhance teachers' professional competence in digital literacy. These steps encompass training, school policies, digital security, and collaboration among educators to ensure the optimal integration of technology into learning.

1. Training and Professional Development

To improve teachers' skills in managing technology, continuous training programs are essential. Regular workshops and training sessions should be conducted to equip teachers with a deeper understanding of technology use in education. Additionally, digital literacy certification can be a crucial step in enhancing teachers' skills in managing digital devices and platforms effectively.

2. Implementation of School Policies Supporting Digitalization

Schools must take an active role in supporting digital transformation by improving access to technological infrastructure, such as providing computers, stable internet networks, and digital learning platforms. Moreover, the development of a technology-based curriculum should be implemented to encourage collaboration between teachers and students in various digital projects, making learning more interactive and innovative.

3. Enhancing Awareness of Digital Security

Digital security awareness is a crucial aspect of digital literacy. Therefore, digital security topics should be included in training programs for both teachers and students. Schools should also provide guidelines and policies governing the ethical use of technology in education to reduce the risk of digital information misuse and increase understanding of legal aspects related to the digital world.

4. Collaboration and Sharing Best Practices

To accelerate the adoption of technology in education, teachers should be encouraged to share their experiences and best practices in utilizing technology. Discussion forums, online learning communities, and digital teacher networks can serve as platforms for educators to exchange information and strategies related to digital-based learning. With such a collaborative ecosystem, teachers can support each other and effectively develop their digital skills.

Implementing these strategies will significantly enhance teachers' professional competence in digital literacy, ultimately leading to improved learning quality and better student preparedness for challenges in the digital era.

5. Conclusion

The findings of this study emphasize that digital literacy plays a crucial role in supporting teachers' professional competence. To address the challenges of 21st-century education, teachers are required not only to master subject matter deeply but also to utilize digital technology effectively, ethically, and securely. Therefore, enhancing digital literacy competence must be an integral part of teachers' professional development strategies to create more interactive, innovative, and relevant learning experiences aligned with technological advancements. Based on the results of this study, several suggestions can be proposed for future research: (1) Future researchers are encouraged to conduct longitudinal studies to observe the long-term impact of teachers' professional competence on students' digital literacy growth over time; (2) Comparative studies between urban and rural schools can provide a broader understanding of the digital literacy gap and the role of teachers' competencies in different educational contexts; (3) Further research can explore the integration of digital literacy training within teacher education and professional development programs to assess its direct impact on classroom practices; (4) Future studies may include student perspectives to evaluate how teacher competencies influence their motivation and ability to engage with digital

learning tools; and (5) Researchers can also investigate the role of school leadership and institutional policies in supporting the development of both teacher and student digital literacy skills.

Declarations

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The author declares no competing financial, professional, or personal interests.

Consent for publication

The author declares that he/she consented to the publication of this study.

Authors' contributions

Author's independent contribution.

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