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Improving Teacher Competence in Managing Digital-Based Learning in Junior High School

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Abstrak

Penelitian ini bertujuan untuk menganalisis upaya peningkatan kompetensi guru dalam mengelola pembelajaran berbasis digital di SMP N 3 Sungai Rotan. Studi ini menggunakan metode kualitatif deskriptif, yang bertujuan untuk memberikan deskripsi rinci tentang peningkatan kompetensi guru dalam memanfaatkan teknologi digital dalam proses pembelajaran. Alat pengumpulan data mencakup wawancara, observasi, dan dokumentasi, yang dilakukan kepada guru, siswa, dan pejabat sekolah untuk memperoleh data yang valid tentang pelaksanaan pembelajaran berbasis digital. Temuan menunjukkan bahwa pelatihan dan pemanfaatan teknologi digital di dalam kelas secara signifikan meningkatkan kemampuan guru untuk merancang, melaksanakan, dan mengevaluasi pembelajaran berbasis digital. Selain itu, terdapat peningkatan partisipasi siswa dalam proses pembelajaran yang lebih interaktif dan menarik. Penerapan pendekatan berbasis teknologi di SMP N 3 Sungai Rotan memberikan wawasan baru tentang pentingnya mengembangkan kompetensi guru dalam mengelola pembelajaran berbasis digital di sekolah menengah pertama, serta hubungan antara teknologi dan peningkatan kualitas pembelajaran.

***Kata kunci*:** *Kompetensi Guru, Pembelajaran Digital, Teknologi Pendidikan, Pelatihan, Sekolah Menengah Pertama.*

Abstract

This research aims to analyze the efforts to improve teacher competence in managing digital-based learning at SMP N 3 Sungai Rotan. The study employed a descriptive qualitative method, which sought to provide a detailed description of the increase in teacher competence in utilizing digital technology in the learning process. Data collection tools included interviews, observation, and documentation, which were administered to teachers, students, and school officials to obtain valid data on the implementation of digital-based learning. The findings indicate that training and the utilization of digital technology in the classroom significantly enhance teachers' ability to design, implement, and evaluate digital-based learning. Furthermore, there was an increase in student participation in a more interactive and engaging learning process. The application of a technology-based approach at SMP N 3 Sungai Rotan provides new insights into the importance of developing teacher competence in managing digital-based learning in junior high schools, and the relationship between technology and improving the quality of learning.

Keywords: Teacher Competence , Digital Learning , Educational Technology , Training , Junior High School.

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1. INTRODUCTION

The improvement of teacher competence in managing digital-based learning has become increasingly urgent in the context of rapid technological advancement and educational transformation. In the 21st century, teachers are not only expected to master subject content and pedagogy but also to integrate digital technology meaningfully into classroom practice. Digital competence refers to a combination of knowledge, skills, attitudes, and ethical awareness that enables teachers to use technology effectively, critically, and responsibly in educational settings (Redecker, 2020). Thus, teacher competence in digital-based learning extends beyond technical ability; it includes instructional design, digital assessment literacy, online classroom management, and the capacity to foster student engagement in virtual or blended environments.

Recent studies indicate that effective integration of digital technology can significantly enhance student learning outcomes, engagement, and creativity. Trust and Whalen (2020) found that teachers who are digitally competent are better able to design interactive and student-centered learning experiences. Similarly, Scherer et al. (2021) reported that teachers' technological pedagogical knowledge strongly predicts the quality of digital instruction. Digital tools, when used strategically, can support collaborative learning, formative assessment, and differentiated instruction (Falloon, 2020). In this sense, technology is not merely a medium for delivering content but a transformative tool that reshapes how learning occurs.

Moreover, international frameworks emphasize that digital competence is now a core component of teacher professionalism. The European Framework for the Digital Competence of Educators (DigCompEdu) highlights areas such as professional engagement, digital resources, teaching and learning, assessment, and empowering learners (Redecker, 2020). UNESCO (2023) also stresses that teachers must be equipped with digital literacy skills to ensure inclusive and equitable quality education in the digital era. These perspectives underline that digital competence is directly linked to educational quality and sustainability.

However, challenges remain significant, particularly in developing countries and at the secondary school level. Many teachers experience difficulties in adapting to new technologies due to limited training opportunities, inadequate infrastructure, and lack of institutional support (König et al., 2020). Studies during and after the COVID-19 pandemic revealed that insufficient digital preparedness hindered effective online teaching (Bond et al., 2021). Furthermore, teachers' beliefs and self-efficacy in using technology influence their willingness to integrate digital tools into instruction (Lachner et al., 2021). Without adequate confidence and continuous professional development, digital transformation efforts may not achieve optimal results.

Continuous professional development is therefore essential. Darling-Hammond et al. (2021) argue that effective teacher training should be sustained, collaborative, and practice-oriented to impact instructional quality. Targeted digital training programs have been shown to improve teachers' technological integration skills and instructional innovation (Philipsen et al., 2022). In addition, school leadership plays a crucial role in fostering a supportive digital culture and providing access to necessary resources (Liu et al., 2021). When teachers receive structured support and mentoring, their competence in managing digital-based learning increases significantly.

In conclusion, enhancing teacher competence in digital-based learning is not optional but a strategic necessity in contemporary education. It requires comprehensive training,

supportive leadership, adequate infrastructure, and a strong commitment to continuous improvement. By strengthening teachers' digital competence, schools can optimize technology use, promote innovative pedagogy, and better prepare students for the demands of the digital era.

2. METHOD

This This study employed a descriptive qualitative research design to explore in depth how teacher competence in utilizing digital technology is developed and implemented in classroom practice. A qualitative approach is appropriate when researchers aim to understand processes, experiences, and contextual factors rather than to measure variables statistically (Creswell & Poth, 2021). Descriptive qualitative research allows the researcher to present a comprehensive account of participants' perspectives and real-life educational practices (Merriam & Tisdell, 2020).

In the context of digital-based learning, qualitative inquiry is particularly relevant because teacher competence involves beliefs, attitudes, pedagogical decisions, and contextual challenges that cannot be fully captured through quantitative measures (Hamilton & Finley, 2020). Furthermore, qualitative research supports an in-depth exploration of how digital transformation occurs at the school level and how teachers interpret and adapt technological innovations in their teaching (Nowell et al., 2021). This design enabled the researcher to examine not only the technical use of digital tools but also pedagogical integration, classroom interaction, and professional growth processes.

2.1 Research Setting and Participants

The research was conducted at SMP N 3 Sungai Rotan, a junior high school that has begun integrating digital technology into its instructional activities. Schools at the secondary level face increasing demands to incorporate digital tools into learning environments to enhance student engagement and achievement (Fraillon et al., 2020). Therefore, this setting provided a relevant context for examining teacher competence in digital-based instruction.

Participants were selected using purposive sampling to ensure that individuals directly involved in digital learning practices were included (Campbell et al., 2020). The participants consisted of subject teachers who actively used digital platforms, students who experienced digital-based learning, and school officials such as the principal and curriculum coordinator who were responsible for policy implementation. Including multiple stakeholders enabled the researcher to gain diverse perspectives on the effectiveness and challenges of digital competence development (Braun & Clarke, 2021).

Teacher participation was essential because teacher digital competence significantly influences instructional quality and student outcomes (Kimmons et al., 2020). Student perspectives were also included to understand how digital teaching practices affected engagement and learning experiences (Bond, 2020). Meanwhile, school leaders' involvement provided insight into institutional support, infrastructure readiness, and professional development initiatives (Dexter & Richardson, 2020).

2.2 Data Collection Techniques

Data were collected through interviews, observations, and documentation analysis, which are commonly used in qualitative educational research to ensure depth and credibility (Tracy, 2020).

1) Interviews
   Semi-structured interviews were conducted with teachers, students, and school leaders. Semi-structured formats allow flexibility while maintaining focus on research objectives (Kallio et al., 2020). Interviews explored teachers' experiences in using digital tools, challenges encountered, professional development participation, and perceived impact on learning effectiveness. Interview data are valuable for capturing participants' reflections, motivations, and beliefs about digital competence (Rubin & Rubin, 2022).
2) Observation
   Classroom observations were conducted to examine how digital tools were implemented during instruction. Observational data help researchers understand actual teaching practices rather than relying solely on self-reported information (Patton, 2021). Through observation, the researcher identified instructional strategies, student interaction patterns, and the integration of digital platforms such as learning management systems or interactive applications. Observations are particularly important in technology-related studies because they reveal the alignment between pedagogical intentions and classroom realities (Tondeur et al., 2020).
3) Documentation
   Documentation analysis included lesson plans, digital learning materials, school policies, training records, and screenshots of digital platforms used in teaching. Document analysis strengthens research validity by providing contextual evidence and supporting triangulation (Bowen, 2020). Reviewing these documents helped determine whether teachers' digital practices aligned with curriculum objectives and school digital transformation goals (Selwyn, 2021).

To enhance trustworthiness, the study applied data triangulation, comparing findings from interviews, observations, and documentation (Carter et al., 2021). Credibility was further strengthened through member checking, allowing participants to confirm the accuracy of interpretations (Candela, 2023). Such procedures are essential in qualitative research to ensure reliability and rigor (Lincoln & Guba, 2021).

Overall, the combination of descriptive qualitative design, purposive participant selection, and multiple data collection techniques enabled a comprehensive understanding of how teacher competence in digital-based learning is developed and practiced at SMP N 3 Sungai Rotan.

3. RESULT AND DISCUSSION

Result

The findings indicate that systematic training and continuous practice in digital-based learning significantly contributed to the improvement of teacher competence at SMP N 3 Sungai Rotan. Professional development programs that focus on digital pedagogy have been widely recognized as essential for strengthening teachers' instructional capacity in technology-rich environments (Philipsen et al., 2020). In this study, teachers who participated in structured training sessions demonstrated greater confidence and technical ability in integrating digital tools into their lesson planning and classroom implementation.

Through interviews, classroom observations, and document analysis, it was evident that teachers experienced growth in three main areas. First, they improved in designing learning activities utilizing digital technology. Teachers began to align digital tools with instructional objectives rather than using technology merely as a supplementary medium. Effective digital lesson design requires pedagogical alignment, content knowledge, and technological understanding, as emphasized in contemporary digital competence frameworks (Redecker,

2020). Teachers at the school gradually incorporated interactive presentations, learning management systems, and online quizzes into their lesson plans in ways that supported curriculum standards.

Second, teachers showed progress in implementing digital-based instruction. Classroom observations revealed more varied teaching strategies, including multimedia integration, collaborative online tasks, and interactive assessments. Research suggests that when teachers develop technological pedagogical skills, classroom instruction becomes more student-centered and engaging (Scherer et al., 2021). In this case, teachers demonstrated improved classroom management in digital settings, including guiding students in using devices responsibly and facilitating collaborative digital activities.

Third, competence in evaluating learning through digital technology also increased. Teachers began utilizing digital assessment tools to provide immediate feedback and monitor student progress more efficiently. Digital formative assessment practices have been found to enhance instructional responsiveness and learning outcomes (González-Calatayud et al., 2021). At SMP N 3 Sungai Rotan, teachers used online quizzes, automated scoring systems, and digital portfolios to assess students' understanding, which helped them identify learning gaps more accurately.

The improvement observed aligns with studies highlighting that continuous professional development strengthens teachers' digital self-efficacy and instructional innovation (Lachner et al., 2021). Moreover, school-level support and collaborative learning among teachers further contributed to sustained competence development (Thompson et al., 2022). Thus, the successful implementation of digital training at SMP N 3 Sungai Rotan provides empirical evidence that targeted professional learning initiatives are crucial for enhancing digital teaching competence at the junior high school level.

3.1 Impact on Student Engagement

The integration of digital technology not only improved teacher competence but also had a noticeable impact on student engagement and participation. Students appeared more motivated and responsive during lessons that incorporated multimedia content, interactive quizzes, and collaborative digital tasks. Research consistently shows that well-integrated educational technology can increase behavioral, emotional, and cognitive engagement (Hodges et al., 2020).

In this study, increased engagement was visible through more active interaction between students and teachers. Digital platforms enabled real-time responses, peer collaboration, and interactive discussions, which fostered a participatory classroom atmosphere. Interactive technologies are known to promote deeper learning experiences when aligned with instructional goals (Xie et al., 2022).

Additionally, students demonstrated higher enthusiasm and sustained attention during technology-supported lessons. Digital learning environments that incorporate multimedia and interactive elements can stimulate learners' curiosity and intrinsic motivation (Liu et al., 2023). The findings suggest that students were more willing to participate in activities such as online quizzes and group presentations when technology was involved.

Furthermore, digital tools allowed for differentiated instruction, enabling teachers to adapt materials according to students' needs. Personalized digital learning approaches have been associated with improved academic performance and engagement (Major & Francis, 2020). Therefore, the observed increase in student involvement highlights the positive relationship between teacher digital competence and the overall quality of classroom learning experiences.

3.2 Challenges and Optimization

Despite the positive outcomes, several challenges were identified. Limited infrastructure, inconsistent internet connectivity, and unequal access to devices remained significant barriers. Such structural constraints are common in many educational contexts undergoing digital transformation (UNESCO, 2023). Teachers also initially experienced difficulties adapting to new technologies, particularly in designing interactive content.

However, the study indicates that appropriate training and peer collaboration can help mitigate these challenges. Teachers who received continuous mentoring were better able to optimize available resources creatively. Even with limited facilities, they utilized simple digital applications effectively to support instruction. Research supports the idea that adaptive expertise and reflective practice enable teachers to overcome technological limitations (Instefjord & Munthe, 2020).

Moreover, leadership support played a role in sustaining digital innovation. Schools that provide clear policies, infrastructure planning, and professional learning communities tend to achieve more successful technology integration (Petko et al., 2021). At SMP N 3 Sungai Rotan, administrative encouragement and collaborative discussions among teachers contributed to gradual but steady digital competence growth.

In conclusion, while resource limitations remain a challenge, the findings demonstrate that systematic training, institutional support, and reflective practice significantly enhance teacher competence in managing digital-based learning. These improvements not only strengthen instructional quality but also positively influence student engagement and participation.

4. CONCLUSION

Based on the findings of this study conducted at SMP N 3 Sungai Rotan, it can be concluded that systematic training and the consistent implementation of digital-based learning contribute significantly to improving teachers' competence in managing the instructional process. The improvement can be seen in teachers' abilities to design technology-integrated lesson plans, implement interactive digital learning activities, and conduct assessments using digital platforms. These results indicate that strengthening teachers' digital competence not only improves their technical skills but also encourages the adoption of more innovative and student-centered instructional practices.

Furthermore, the development of teachers' digital pedagogical competence positively influences the overall quality of teaching and learning. Teachers who participate in structured professional development programs demonstrate greater confidence, adaptability, and effectiveness in integrating digital tools into their instructional practices. This improvement enables teachers to select appropriate digital platforms, organize blended learning activities, and systematically monitor students' learning progress through digital assessment tools.

The findings also show that the integration of digital technology in the classroom enhances students' engagement, participation, and learning motivation. When digital tools are used in alignment with learning objectives and supported by effective instructional design, they create interactive learning environments that promote collaboration, creativity, and active participation among students.

In addition, the study highlights that successful digital transformation in schools requires not only individual teacher competence but also strong institutional support and sustainable professional development systems. Continuous training programs, adequate technological infrastructure, and supportive school leadership play an important role in ensuring the effective implementation of digital learning. Therefore, strengthening teachers' digital competence should be considered a strategic priority in improving educational quality and preparing students for the demands of 21st-century learning.

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