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Bridging the Gap: Challenges and Strategies in Digital Learning Evaluation Among Technologically Inexperienced Teachers

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ABSTRACT

This study investigates the challenges faced by secondary school teachers in implementing technology-based learning evaluations, focusing on limitations in digital competence. Employing a qualitative case study approach, data were collected through interviews, classroom observations, and document analysis at a public secondary school in Indonesia. The findings reveal that teachers' lack of digital literacy hampers the effective use of Learning Management Systems (LMS) and assessment tools. Educators often struggle with navigating digital platforms and designing meaningful evaluations, primarily due to insufficient training and a lack of sustained professional development. Additionally, infrastructure-related issues such as unstable internet access and limited availability of devices emerge as significant obstacles to effective technology integration. The study highlights the critical role of comprehensive training programs, peer collaboration, and supportive school leadership in enhancing teacher readiness for digital assessment. It also points to the need for policy-level interventions that prioritize equitable access to digital resources and capacity building. By identifying systemic and individual-level barriers, this research contributes to the discourse on digital transformation in education. It offers practical recommendations for educational stakeholders seeking to improve digital learning evaluation practices and promote equity and quality in the digital age.

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1. Introduction

The ongoing digital transformation has significantly reshaped educational practices, introducing new approaches to teaching, interaction, content delivery, and student assessment. As digital tools become integral to educational systems, learning evaluations have evolved from conventional, paper-based formats into dynamic, technology-enhanced methods. These digital assessments offer benefits such

as greater flexibility, personalization, and immediacy in measuring student learning outcomes. However, for many teachers particularly those with limited digital experience the integration of such tools presents substantial challenges (Konca & Erden, 2021; Pelila et al., 2022). Educators must navigate new platforms while fulfilling traditional teaching duties, making technology adoption a complex pedagogical and institutional issue.

One of the most critical barriers is the lack of digital competence among teachers. Studies show that educators often find it difficult to operate digital platforms and apply online assessment tools due to inadequate training and limited familiarity (Hashim et al., 2023; Xie et al., 2021). Additionally, infrastructure problems, such as unstable internet connections and insufficient access to digital devices, exacerbate these difficulties, especially in rural and underserved schools (Dewi et al., 2020; Ohei et al., 2023). Even highly motivated teachers can be discouraged by inadequate support systems. Psychological and attitudinal barriers including low self-efficacy and negative perceptions of technology further limit their willingness to innovate with digital tools (Wali & Popal, 2020; Wei et al., 2023). Addressing these interrelated obstacles requires holistic strategies that combine technical, pedagogical, and institutional responses.

The persistent digital literacy gap among teachers has a direct impact on the quality of digital learning evaluation. Educators with strong digital skills are better able to design meaningful assessments, leverage digital tools for immediate feedback, and enhance student engagement through interactive learning environments (M. Li & Yu, 2022; Sánchez-Cruzado et al., 2021). In contrast, teachers with low digital literacy often default to outdated, non-interactive assessment methods that do not reflect students' diverse learning needs (Hakim, 2021; Lee et al., 2022). This gap contributes to inequities in learning experiences and outcomes. Strengthening digital literacy is, therefore, essential to ensure that technology-based evaluation practices are effective and inclusive.

Another key determinant of successful technology integration is the availability of adequate school infrastructure. High-speed internet, functional digital devices, and access to educational content platforms form the foundation for effective digital instruction and assessment (Ansari et al., 2022; Gupta & Hayath, 2022). Where infrastructure is reliable, digital assessments can be implemented using tools such as online quizzes, adaptive learning platforms, and real-time analytics (Anwar et al., 2024; Mbise & Simba, 2022). In contrast, poor infrastructure results in inconsistent digital practices and discourages teachers from using available tools. This is especially true in marginalized regions, where infrastructural inequity magnifies existing educational gaps (Adeniyi et al., 2024; Moralista & Oducado, 2020). Equitable investment in infrastructure is thus vital for the consistent implementation of quality digital assessments (Alamin et al., 2023; Zhang & Tahir, 2023).

Demographic factors also influence teachers' adoption of educational technologies. Younger teachers, often referred to as digital natives, tend to adapt more easily to new tools and show greater fluency in using them for classroom instruction (Anzari et al., 2021; Syafii & Anam, 2022). In contrast, older teachers may be less familiar with such technologies and more resistant to pedagogical change (Alnujaidi, 2021; Y. Li et al., 2022). While experienced educators may have strong instructional skills, they often face difficulties in adjusting to digital practices (Höl & Aydın, 2020; Sabeki et al., 2023). For this reason, professional development initiatives should consider demographic variations. Tailored training, particularly those based on the Technological Pedagogical Content Knowledge (TPACK) framework, can help teachers from all backgrounds build confidence and competence in digital assessment (Kumala et al., 2022; Özmen et al., 2024).

Institutional and cultural factors also shape teachers' readiness for digital transformation. Effective digital leadership by school administrators plays a central role in establishing supportive environments that encourage innovation (Hamzah et al., 2021; Orunbon et al., 2023). Peer collaboration, shared professional learning, and co-teaching foster a culture of mutual support that enhances teacher confidence (Kirinić et al., 2023; Subedi & Sherpa, 2022). Ongoing training that demonstrates practical, classroom-based applications of digital tools helps reduce anxiety and builds teachers' practical capabilities (Moreira et al., 2023). At the same time, ensuring stable internet access and adequate resources provides the foundation for these cultural and pedagogical shifts to be sustainable (Daifallah & Hadban, 2023; Widat

& Kurniawan, 2023). A coordinated strategy that links leadership, training, and infrastructure is essential for effective digital learning evaluation.

The COVID-19 pandemic has further accelerated the use of digital tools in education. With the shift to remote learning, digital assessment became a necessity, highlighting both the potential and the limitations of existing technologies (Al-Kumaim et al., 2021; Toma et al., 2021). Educators quickly adopted digital tools to maintain learning continuity, often using formative and summative online evaluations (Chen et al., 2023). While this period exposed severe inequities in access, it also emphasized the importance of digital tools in ensuring timely feedback and sustained student engagement (Larsari, 2024; Molise & Dube, 2020). The experience has left a lasting impression on educational systems, reinforcing the need for resilient, technology-integrated evaluation models.

This study investigates the challenges experienced by secondary school teachers in implementing technology-based learning evaluations, particularly those with limited digital competence. Using a qualitative case study approach, the research aims to examine how individual, institutional, and contextual factors intersect to shape teachers' experiences. It addresses a gap in the literature by offering practical insights into the systemic and skill-based barriers faced by teachers and provides recommendations for strengthening institutional support and teacher readiness. By analyzing the interrelated challenges of digital competence, professional development, and infrastructure, the study seeks to inform more inclusive and adaptive frameworks for learning evaluation in the digital age.

2. Method

This study employs a qualitative case study design to investigate the challenges encountered by teachers in implementing technology-based learning evaluation, particularly those with limited digital competencies. A case study approach is appropriate for exploring complex, real-life phenomena and offers a nuanced understanding of how individual, institutional, and contextual factors shape technology adoption in educational settings (Ilhami et al., 2025; Simuja & Shikesho, 2024). This design aligns with the exploratory nature of the research questions, which aim to uncover how and why teachers experience specific challenges in conducting digital evaluations.

2.1 Research Site

The study was conducted at SMP Negeri 1 Juwana, located in the Juwana District of Pati Regency, Indonesia. The school was selected as a representative case due to its moderate technological infrastructure and diverse teaching staff with varying levels of digital literacy. This setting provided a suitable context to examine the practical challenges and opportunities of integrating technology into assessment practices.

2.2 Participant Selection

Purposive sampling was used to select participants who possessed relevant insights and experience. Teachers were chosen based on two main criteria: a minimum of three years of teaching experience and active engagement in learning evaluation processes involving digital tools. This ensured that the sample included educators with meaningful exposure to both the benefits and limitations of digital assessment practices (Simuja & Shikesho, 2024). Participants represented multiple subject areas, enhancing the depth and diversity of the data.

2.3 Data Collection Methods

A triangulated data collection approach was adopted to enhance validity and depth. Three primary methods were employed:

2.3.1 **Semi-Structured Interviews:** These served as the core data collection method. Open-ended questions were used to elicit teachers' perceptions, attitudes, and experiences with digital learning evaluations. Interviews were conducted via Zoom and audio-recorded with participants' consent.

2.3.2 **Classroom Observations:** Both virtual and in-person observations were conducted to verify and contextualize self-reported data. Observational focus included the use of LMS platforms, feedback mechanisms, and digital tools during assessment.

2.3.3 **Document Analysis:** Supporting materials such as lesson plans, evaluation rubrics, school policy documents, and platform usage records were reviewed to provide institutional context and complement the interview and observation data.

2.4 Data Analysis

Data were analyzed using thematic analysis. Transcripts, observation notes, and documents were coded and categorized according to emerging themes, including digital skill gaps, infrastructure limitations, and resistance to change. The Technological Pedagogical Content Knowledge (TPACK) framework guided the analytical process, allowing for an integrated perspective on how technological, pedagogical, and content knowledge interact to influence digital evaluation practices (Fajrie et al., 2023).

2.5 Trustworthiness and Reflexivity

To ensure credibility, triangulation across data sources was employed (Viani, 2021). Member checking was carried out by sharing interview summaries with participants for validation. An audit trail was maintained, documenting coding procedures and analytic decisions.

Researcher reflexivity was emphasized throughout the study. The research team continuously reflected on their own positionality, biases, and assumptions to mitigate subjectivity in data interpretation (OLIINYK et al., 2022). These reflections were documented to ensure transparency and enhance confirmability.

2.6 Ethical Considerations

Ethical guidelines were rigorously followed. Participants were fully informed about the study's objectives and their rights, including voluntary participation and the ability to withdraw at any time. Informed consent was obtained before data collection, and participant anonymity was protected. All data were securely stored and limited to research team access (Huang & Teo, 2020).

2.7 Methodological Justification

The combination of interviews, observations, and document analysis allowed for a comprehensive and multidimensional understanding of the challenges teachers face in integrating technology into assessment. Interviews revealed subjective experiences, while observations highlighted real-world practices. Document analysis added institutional perspective. This multi-method strategy enabled the study to uncover both explicit and implicit barriers to effective digital evaluation (Aimang et al., 2024; Suwandi, 2023).

Overall, the qualitative case study approach provided a robust framework to explore the real-world complexities of technology adoption in education. The insights generated from this methodology have significant implications for policy, training, and institutional support for teachers navigating digital transformation in assessment.

3. Result

This study investigated the challenges teachers face in implementing digital learning evaluations, particularly related to digital skill limitations and infrastructure constraints. Based on qualitative data from interviews, classroom observations, and document analysis at SMP Negeri 1 Juwana, four major themes emerged: (1) digital skill gaps in using LMS and assessment tools, (2) the impact of limited digital competence on assessment practices, (3) the role of training programs, and (4) infrastructure-related barriers.

3.1 Digital Skill Gaps in Using LMS and Assessment Tools

Many teachers exhibited substantial difficulties in operating Learning Management Systems (LMS) and digital assessment tools. These skill gaps stem from a lack of integration between technical know-how and pedagogical understanding (Althubyani, 2024; García-Delgado et al., 2023). While some teachers could upload assignments, many struggled with advanced functions such as automated grading, multimedia feedback, and performance analytics.

Insufficient training contributed significantly to this problem. Teachers reported that available training was infrequent, outdated, and disconnected from real classroom needs. This lack of ongoing

professional development diminished teacher confidence and contributed to what some described as technological fatigue or burnout (Iatrou et al., 2024; Shamir-Inbal et al., 2024).

Observation data confirmed that LMS tools were often underused or used superficially, without leveraging their interactive or adaptive capabilities. These findings underscore the need for training that emphasizes pedagogical use, not just technical operation, of digital tools (Ovcharuk & Ivaniuk, 2021; Torres et al., 2020).

3.2 Impact of Limited Digital Competence on Assessment Practices

Teachers with low digital competence typically avoided interactive or personalized assessments. As a result, they reverted to static, uniform formats that failed to accommodate diverse student needs (Tondeur et al., 2023). Even when digital tools were used, their application was often ineffective teachers were unable to interpret data or adjust instruction accordingly.

This reflects a broader trend in which digital tools are used for procedural rather than pedagogical purposes (Dias-Trindade & Moreira, 2020; Romero et al., 2020). The additional burden of heavy workloads and lack of technical assistance further discouraged experimentation with new assessment formats (Isoda et al., 2021; Omar & Mohmad, 2023). Students were also less engaged when digital assessments lacked interactivity, limiting the formative potential of technology-enhanced evaluation.

3.3 Role of Training Programs in Enhancing Digital Assessment Practices

The data strongly suggest that well-designed professional development is a key enabler of effective digital assessment. Teachers emphasized that training programs integrating technical and pedagogical components had the greatest impact on their practice. This aligns with research on the importance of Education 4.0-aligned competencies (Ayanwale et al., 2024).

Training grounded in the TPACK framework helped teachers align tools with learning objectives and student needs (Oktaviani & Utami, 2024). Teachers who participated in such programs were more confident in selecting appropriate digital tools and designing engaging assessments.

Teachers also highlighted the importance of informal learning through peer mentoring, self-paced exploration, and collaborative problem-solving (Batanero et al., 2020; Berezhna & Bessarab, 2024). However, access to training was uneven, leading to disparities in digital competence across staff.

These findings affirm that professional development must be sustained, relevant, and accessible to all educators.

3.4 Infrastructure Constraints in Supporting Digital Evaluation

Infrastructure was a critical enabling or limiting factor. While some resources like computers and internet access were available, their usability varied. Teachers reported that Wi-Fi was often unstable, and many devices were outdated.

Such infrastructural inconsistencies hindered the consistent use of LMS and digital tools (Nadifa & Ambarwati, 2024). In classrooms with adequate infrastructure, digital assessments were implemented more smoothly and with greater student participation (ZENGİN, 2023). In contrast, unreliable internet and insufficient hardware discouraged usage and narrowed assessment options.

Leadership support partially mitigated these challenges. Teachers who received assistance in accessing or troubleshooting tools were more likely to continue using them (Korumaz & GÖLÇEK, 2021). However, as noted by Dincher and Wagner (2021), infrastructure alone is insufficient—without appropriate training and pedagogical alignment, digital tools remain underutilized.

At SMP Negeri 1 Juwana, this was evident: despite having basic infrastructure, some classrooms remained largely analog due to gaps in training and confidence

4. Discussion

The study's findings highlight a central issue in educational transformation: teacher digital competence is a critical determinant of successful learning evaluation in technology-rich environments. Although digital assessment tools offer substantial benefits for personalization, engagement, and feedback, these advantages cannot be fully realized without digitally proficient educators. This discussion interprets the findings in relation to the broader literature and outlines key implications for educational policy, institutional practice, and future innovations.

4.1 Long-Term Impacts of Inadequate Teacher Digital Skills

Limited teacher digital competence restricts the implementation of effective technology-based assessments, with direct and lasting consequences for student outcomes. When educators are unable to utilize platforms such as LMS or integrate digital tools meaningfully, students miss opportunities to engage in interactive, feedback-rich learning experiences (Blasco & Bueno, 2024; Kiryakova & Kozhuharova, 2024).

Numerous studies affirm that digital classrooms foster essential 21st-century skills, including critical thinking, collaboration, and creativity (Gündüzalp, 2021; Hasanah et al., 2022). However, when digital tools are used superficially or not at all, student engagement often declines, leading to shallow learning and reduced knowledge retention (Alanoğlu et al., 2021; García-Delgado et al., 2023).

This disconnect between digital-native students and analog assessment practices may widen existing educational disparities. Learners accustomed to engaging with technology in everyday life may find traditional assessments disengaging, ultimately impacting their motivation and academic performance (Demir et al., 2022). These effects are exacerbated in under-resourced schools, where limited infrastructure and teacher training further reinforce inequities.

4.2 Institutional and Policy Support for Digital Assessment Integration

While teacher competence is foundational, institutional support and policy frameworks are equally vital. National education systems must establish comprehensive strategies that include infrastructure development, continuous professional development, and collaborative professional cultures. For example, Chile's long-term policy commitment to educational technology integration demonstrates the benefits of sustained, top-down support (Araújo et al., 2024).

At the school level, institutions that invest in teacher training, ensure reliable access to digital tools, and cultivate peer collaboration are better positioned to embed digital assessment practices effectively (Adarkwah, 2020). Policies should not be limited to providing hardware or internet access but must also address human capacity building. One-time workshops are insufficient; instead, iterative training models that include mentorship, reflective practice, and the use of pedagogical frameworks such as TPACK have been shown to build lasting competence.

Moreover, fostering teacher agency through institutional trust and leadership can accelerate innovation. Teachers who feel empowered and supported are more likely to experiment with new assessment methods and sustain changes in practice.

4.3 Emerging Technologies and the Future of Digital Assessment

Emerging technologies, particularly Artificial Intelligence (AI) and adaptive learning systems, present promising possibilities for more responsive and personalized assessment. AI-powered platforms can analyze student learning patterns in real-time, delivering immediate feedback and enabling data-driven instruction (Wang et al., 2024). Adaptive systems tailor assessment paths based on student progress, promoting deeper learning and better alignment with individual competencies.

Gamification and digital portfolios offer alternative strategies for assessment that focus on student engagement and motivation. Although empirical research on their impact is still developing, early findings suggest these tools can enhance intrinsic motivation and support formative feedback cycles.

However, caution is warranted. Without adequate digital and pedagogical preparation, teachers may misuse or underutilize these technologies. There are also significant ethical concerns related to data security, surveillance, and equitable access. Institutional safeguards, policy regulation, and professional development must evolve alongside these innovations to ensure responsible and effective implementation.

5. Conclusion

This study examined the challenges teachers face in implementing digital learning evaluations, with a particular emphasis on limitations in digital competence. The findings revealed that gaps in digital literacy significantly impede the effective use of Learning Management Systems (LMS) and other digital assessment tools. These challenges are exacerbated by inadequate training, limited professional development opportunities, and inconsistent technological infrastructure. As a result, many teachers

struggle to design and implement assessments that are interactive, responsive, and aligned with student needs.

A central insight from this research is the critical role of sustained and targeted professional development. Training programs that integrate pedagogical frameworks such as Technological Pedagogical Content Knowledge (TPACK) can strengthen teachers' confidence and competence in using digital tools effectively. Additionally, institutional and policy-level support including reliable infrastructure, access to resources, and leadership encouragement are essential to enabling systemic and sustainable digital transformation.

The findings suggest that advancing teachers' digital readiness should be a strategic priority in educational reform efforts. Future studies are encouraged to investigate scalable models of professional development, evaluate the use of emerging technologies like AI and adaptive learning systems in assessments, and examine how policy frameworks can bridge digital equity gaps across regions.

Ultimately, equipping teachers with the necessary skills and systemic support is key to realizing the full potential of technology-enhanced assessments. This will not only improve educational quality but also foster equity and inclusion in increasingly digital learning environments.

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