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Digital Literacy and Pedagogical Transformation: A Case Study of Teachers' Training in Remote Areas

Sujariati[a1*], Yassir Mallapiang,[a2], Ika Sastrawati ,[a3]

[ab]**Faculty of Teacher Trainer and Education, Universitas Muhammadiyah Makassar, Indonesia.**
[1]sujariati@unismuh.ac.id. [2]katsratulbukaa@gmail.com . [3]ikasastrawati@unismuh.ac.id.
[*]**corresponding Author**

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ABSTRACT

With a focus on SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa, this study investigated how digital literacy aids in pedagogical transformation in rural schools. In order to support pedagogical transformation in rural schools, the main goals were to investigate the digital literacy of teachers, the efficacy of training programs, the difficulties in implementing digital learning, and potential models and solutions. A purposive sample of twelve teachers was used in a qualitative case study design. Semi-structured interviews, document reviews, and classroom observations were used to gather data. Teachers' abilities, experiences, and reflections were recorded by the instruments, and thematic analysis was used to examine the data. The results showed that although teachers have rudimentary to intermediate digital competencies, they still hardly ever use sophisticated tools for interactive instruction. Because programs were frequently short-term and not adapted to local needs, existing training increased awareness but did not result in meaningful changes. Teachers also mentioned issues like inadequate devices, poor internet access, inadequate infrastructure, and low student engagement. The results of document analysis and interviews suggested that context-sensitive, mentoring-based training models would work better than one-time workshops. Teachers also offered doable fixes, such as bettering the infrastructure, collaborating with the community, and focusing professional development more locally. By emphasizing the significance of contextualizing digital literacy in rural education, this study made a theoretical contribution. In a practical sense, it provided direction for educators and legislators in creating efficient support and training programs. It demonstrated how improved digital proficiency can support more engaging and globally relevant English language instruction in rural Indonesian classrooms.

KEYWORDS

Digital literacy, Pedagogical transformation, Teacher training, Remote areas, Contextual Activities

1. Introduction

Dealing with the speed of technology development, digital literacy has become a crucial issues which is critical skill for educators and students. In order to guarantee effective teaching and learning, integration teaching with digital skills into the classroom is now crucial need and required. Digital literacy is more than just knowing how to use technology; it also includes innovation, creativity, teamwork, critical thinking, critical thinking, creativity, and responsibility as user. Hence, these abilities are crucial for educators to modify their teaching methods to fit the changing demands of students in the twenty-first century (Chai et al., 2021). Thus, essentially to change conventional teaching methods into more engaging and technologically advance, it need to do teacher preparation programs in providing educators with the skills and information,

However, not every educational setting implements digital literacy and pedagogical transformation in the same way. Lack of opportunities for teachers to advance their professional development, restricted access to internet infrastructure, and insufficient technological resources are some of the primary issues that remote schools typically face. Urban and rural schools' educational quality varies as a result of these problems. The disparity in digital readiness among Indonesian schools, especially in areas like Gowa Regency, South Sulawesi, emphasizes the need for efficient models of teacher preparation that can take into account regional conditions and encourage creative teaching methods. According to recent research, educators can use digital literacy to design dynamic, captivating learning environments that are focused on the needs of their students (Farisia & Syafi'i, 2024) . For this reason, teacher professional development has become crucial in equipping educators with the necessary digital and pedagogical skills to adapt to the changing demands of education.

Despite the increasing emphasis on digital education, Teachers' readiness to embrace digital transformation is still not uniform. (Yulin & Danso, 2025) found that although many teachers understand the benefits of integrating technology into the classroom, their efforts are hindered by a lack of training, low self-esteem, and limited curriculum alignment. The TPACK (Technological Pedagogical Content Knowledge) framework is a useful lens for understanding how educators can successfully integrate pedagogy, content, and technology. However, the actual application of these frameworks usually failed or far from expectations in schools that are under-resourced and located in rural areas. Similarly, the importance of training models that integrate practice, observation, and feedback by focusing on the ways in which teachers' digital literacy is influenced by peer collaboration, institutional support, and self-efficacy social cognitive were highlights issue based on theory-based on (Purworini et al., 2024). These opinions are consistent with the larger educational vision of Society 5.0 and 21st-century learning, which sees digital competency as a basis for the fundamental abilities of communication, creativity, critical thinking, and teamwork. (Hidayat et al., 2025)

Several obstacles to implementing digital transformation were identified by a preliminary investigation conducted at SMA Negeri 16 Gowa in Kecamatan Lawwa and SMP Negeri 1 Parigi Gowa, both of which are situated in isolated regions of South Sulawesi. Teachers are forced to rely on costly and unreliable mobile data connections because internet access is frequently erratic. Due to a lack of personal laptops or tablets for many teachers and students, as well as inadequate school facilities like computer labs, access to digital devices is also restricted. Although some training sessions have been held, these are typically one-time events that don't take into account the contextual and long-term needs of teachers in rural areas. Although they reported a lack of confidence in their ability to manage digital platforms, create lessons, and use technology to assess student outcomes, teachers in both schools indicated a strong interest in implementing digital tools (Afrina et al., 2024). . Additionally, there has been uneven institutional support at the district and school levels, especially when it comes to funding professional development and continuing technical assistance.

Based on the preliminary study above, several important gaps become evident and require further attention. Although theoretical models such as TPACK and Social Cognitive Theory provide valuable guidance for integrating technology into teaching, they are still not fully applied in rural school settings, where support and access remain limited. This disconnect contributes to ongoing structural barriers that prevent equal progress in digital transformation, particularly due to the persistent resource divide between urban and rural schools. Additionally, the training programs that do exist are often temporary, unsustained, and not designed to match the specific needs and realities of remote teachers (Salavati, 2016). Consistent with the SAMR model, many teachers continue to use technology merely as a substitute for traditional classroom practices, rather than leveraging it to redesign learning or foster true pedagogical innovation. This shows that deeper instructional change has yet to be achieved.

(Salavati, 2016). These gaps have important ramifications. If digital transformation is not adequately supported, it may worsen educational inequality by widening the gap in learning quality between urban and rural schools. Teachers' lack of digital and pedagogical proficiency may also

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reduce the effectiveness of classroom technology, which would negatively affect student motivation and learning outcomes (Wang et al., 2022). Policymakers and education stakeholders must create teacher training programs that are responsive to local contexts, implemented consistently, and follow the guidelines of effective pedagogical integration in order to address this.

Referes to the background above, the present study is guided by the following research questions: (1) What is the current level of digital literacy among teachers at SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa? (2) To what extent have existing training initiatives supported pedagogical transformation in these schools? (3) What are the key challenges teachers face in adopting digital learning in remote contexts? and (4) What training model would be most effective in supporting digital literacy and pedagogical innovation in rural schools? (5). What are the solution to solve the challenges? Accordingly, this study aims to describe teachers' current digital literacy levels, evaluate the impact of training programs, identify challenges in the field, and propose recommendations for a contextual and sustainable model of teacher training that fosters both digital competence and pedagogical transformation

2. Metho

Research Design

This study employed a **qualitative case study design**. SMA Negeri 16 Gowa (kecamatan Lawwa) and SMP Negeri 1 Parigi (kecamatan PARIGI) are two schools in remote parts of South Sulawesi. With the help of teacher training, this study used a qualitative case study design to examine digital literacy and pedagogical transformation. Because it enables a thorough examination of teachers' experiences, difficulties, and tactics when implementing digital literacy in particular contexts, the case study approach was selected (Creswell & Poth, 2018). Additionally, this design offers the freedom to record detailed accounts of the particular circumstances of rural schools while spotting trends that could guide more general educational practices.

Research Method

The study's main data collection techniques included document analysis, classroom observations, and interviews. Lecturer's opinions of digital literacy, training, and teaching methods were investigated through semi-structured interviews. To document how educators used digital tools in authentic learning environments, observations of classrooms were made, relevant documents, including lesson plans, school reports, and training modules, were also examined in order to support and corroborate field findings.

Research Subjects

For research subject, twelve teachers from SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa participated in this study; they were chosen through purposive sampling to represent a range of subject areas and teaching experience levels. Additionally, one training facilitator and school principals were included as key informants to offer institutional viewpoints on the execution of digital literacy initiatives. Participants were chosen based on their prior experience using digital tools in the classroom and their direct participation in teacher training activities.

Instruments

Several instruments were developed and used for data collection:

1. **Interview Guide**: Semi-structured questions focusing on teachers' digital literacy competence, experiences with training programs, and perceived challenges in pedagogical transformation.
2. **Observation Checklist**: A structured tool designed to record classroom practices, including the use of digital resources, classroom management strategies, and student engagement.
3. **Document Review Sheet**: A framework for analyzing training materials, lesson plans, and school policies related to digital literacy.

Data Analysis

The collected data were analyzed using **thematic analysis** (Braun & Clarke, 2021). To find emerging themes about digital literacy, training effectiveness, difficulties, and pedagogical

practices, observation notes, interview transcripts, and documents were coded inductively. To improve the validity and reliability of the results, data triangulation was used by comparing findings from several sources. By sharing initial results with participants to verify accuracy and interpretation, member checking was carried out to guarantee credibility.

3. Results and Discussion

Findings this study are described with significant variations between individuals and between the two institutions, the examination of the interviews and observations showed that the teachers in both schools exhibited basic to intermediate levels of digital literacy.

The current level of digital literacy among teachers at SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa

The results showed that teachers in both schools possessed a basic to intermediate overall level of digital literacy, with significant individual variation. The majority were comfortable using commonplace digital tools (e.g., smartphones, social media, Microsoft Office Suite, and WhatsApp for communication). However, their capacity to integrate these resources into educational settings was significantly constrained. For instance, while many educators were adept at creating basic PowerPoint slides or distributing assignments via WhatsApp groups, fewer demonstrated the ability to create interactive learning materials using dedicated digital platforms such as Google Classroom, Kahoot, or Edmodo.

In general, younger teachers at SMA Negeri 16 Gowa demonstrated better digital literacy abilities than their more experienced counterparts. They claimed to be more used to experimenting with online resources and investigating digital applications. Digital competency, however, was still mostly limited to content delivery rather than interactive or student-centered learning activities, even among these teachers. Instead of using technology to revolutionize pedagogy, teachers have a tendency to use it to replace conventional teaching techniques.

Infrastructure issues at SMP Negeri 1 Parigi Gowa further limited students' levels of digital literacy. Teachers' ability to practice and hone their digital skills was hampered by frequent internet outages and restricted access to laptops or projectors. Because of this, the use of digital tools in the classroom was uneven and frequently reliant on outside resources. When internet connections failed, some teachers resorted to printed worksheets, while others reported using their personal mobile data to access online resources.

Another noteworthy finding was that many teachers lacked confidence in their capacity to assess digital resources and make sure they matched curriculum objectives. Instructors brought up concerns about managing interactions in online classrooms, choosing suitable digital platforms, and safeguarding the privacy of student data. This points to both a critical literacy and a skills gap, as there is still a lack of ability to evaluate the morality, applicability, and dependability of digital resources.

During interviews, several teachers described themselves as capable of using digital tools but acknowledged that their competence was limited. One teacher at SMA Negeri 16 Gowa stated:

"I can use PowerPoint and sometimes share materials through WhatsApp, but when it comes to applications like Google Classroom or online quizzes, I am still not confident." (Teacher 3, SMA 16 Gowa)

Another teacher from SMP Negeri 1 Parigi Gowa echoed similar concerns, emphasizing infrastructural constraints:
"The internet here is unstable. Even if I want to try new applications, sometimes the connection makes it impossible. So, I usually just give printed worksheets or use my phone." (Teacher 7, SMP 1 Parigi)

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These self-reported limitations were validated by observation data. Teachers mainly used WhatsApp groups to distribute assignments and projected slides to deliver content in a number of the classes that were observed. Seldom were interactive tools like multimedia-based assessments, online tests, or collaborative platforms seen. For example, the instructor at SMP Negeri 1 Parigi tried to use YouTube videos as extra content in one of the classrooms, but was forced to stop because of the poor internet connectivity.

Teachers also expressed uncertainty about evaluating and selecting appropriate digital resources. As one participant noted:
"Sometimes I don't know which website or platform is reliable. I just search on Google, but I am not sure if it fits the curriculum or if the students can really benefit from it." (Teacher 5, SMA 16 Gowa)

From the document review, lesson plans from both schools showed that technology integration was generally limited to slide-based presentations and the use of messaging applications. There was little evidence of systematic use of digital platforms for assessment, collaboration, or differentiated instruction.

It assumed that, despite their willingness to use digital tools, teachers at both schools currently have varying and limited levels of digital literacy. Most of them function at a functional level, which means that while they can be used in basic ways, they have trouble with more complex applications that could facilitate student-centered and interactive learning, this similarly with research by (Cornelia & Sulistyaningrum, 2023). These results imply that teacher preparation programs should concentrate on fostering deeper digital competency rather than just teaching new tools. This is especially important for instructional design, critical evaluation, and classroom integration.

To what extent have existing training initiatives supported pedagogical transformation in these schools?

The findings indicated that while teacher training initiatives have been conducted at both SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa, their contribution to pedagogical transformation has been partial and inconsistent.

Interview Data
Although the majority of teachers said that the digital training workshops were too brief, generic, and lacked follow-up support, they did generally appreciate the opportunity to participate. One teacher from SMA Negeri 16 Gowa reflected:

"The training introduced many applications, but it was only for two days. After that, we did not get guidance on how to apply them in our classrooms." (Teacher 2, SMA 16 Gowa)

Similarly, a participant from SMP Negeri 1 Parigi Gowa highlighted that much of the training felt disconnected from their local realities:

"We were taught about advanced digital platforms, but with our internet situation, it is not practical. Sometimes I feel frustrated because what we learn cannot be applied here." (Teacher 8, SMP 1 Parigi)

A school principal also acknowledged the gap between training and practice:

"Teachers here are enthusiastic, but training programs usually stop at the introduction stage. Without continuous mentoring, they return to their old ways of teaching." (Principal, SMP 1 Parigi)

Observation Data

Observations in the classroom supported these viewpoints. Even though recently trained teachers made an effort to incorporate digital tools, the implementation frequently reverted to

simple substitutions of conventional methods. One educator who participated in a workshop on digital literacy, for instance, collected student assignments using Google Forms. However, the activity was canceled and printed worksheets were given out in its place because of the students' lack of devices and poor internet connectivity. At SMA Negeri 16 Gowa, another observation revealed a teacher presenting lesson slides with additional images and videos. This was an improvement, but there was no digital platform interaction or collaboration.

Overall, observed classroom practices reflected minimal pedagogical transformation. Technology was mostly used as a supplement rather than as a medium for interactive or student-centered learning.

Document Review

The review of school and teacher records provided more evidence of limited transformation. Despite the fact that training certificates attested to teachers' participation in various digital workshops, neither school's lesson plans fully integrated the skills they acquired during training. Most lesson plans only included general instructions such as "use PowerPoint presentation" or "share materials via WhatsApp." Online collaborative tools, interactive platforms, and formative digital assessments were not fully integrated.

In sum, the findings showed that although training initiatives have raised teachers' awareness and energized them, they haven't significantly altered their pedagogical strategies. Due to its short duration, lack of contextual adaptation, and lack of ongoing support, training's impact has been limited. Teachers usually struggle to keep up or change these practices in their classrooms after being introduced to digital tools. As a result, there has been little pedagogical change and digital tools are used more as a substitute than as an innovative tool in teaching and learning, this similarly supported in research by (Muñoz-Martínez et al., 2021).

Table 1. summary findings for three instruments

Source of Data	Evidence Collected	Interpretation
Interviews	*"The training introduced many applications, but it was only for two days. After that, we did not get guidance on how to apply them in our classrooms."* (Teacher 2, SMA 16 Gowa) *"We were taught about advanced digital platforms, but with our internet situation, it is not practical."* (Teacher 8, SMP 1 Parigi) *"Training programs usually stop at the introduction stage. Without continuous mentoring, they return to their old ways of teaching."* (Principal, SMP 1 Parigi)	Training raised awareness but lacked depth, contextualization, and follow-up support. Teachers appreciated exposure but found it hard to apply in practice.
Observations	Teachers who attended training attempted to use tools like Google Forms and YouTube videos, but activities were often abandoned due to poor internet or student access. In many cases, training led to slide-based teaching with added visuals, but without interactive or collaborative pedagogy.	Evidence of partial application; transformation was limited to content presentation rather than pedagogy.
Document Review	Training certificates confirmed teacher participation in workshops. Lesson plans mostly mentioned generic technology use ("PowerPoint," "WhatsApp") without integrating interactive platforms or digital assessment tools.	Training participation documented, but lesson plans showed minimal transfer of skills to classroom planning.
Overall	Training initiatives were implemented but had limited impact on classroom pedagogy.	Extent of pedagogical transformation is low;

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Source of Data	Evidence Collected	Interpretation
		technology is used as substitution, not innovation.

The Key Challenges Teachers Face in Adopting Digital Learning in Remote Contexts

The results collectively demonstrate that while training programs have increased teachers' awareness and given them more energy, they haven't had a major impact on their pedagogical approaches. The impact of training has been limited because of its brief duration, lack of contextual adaptation, and lack of continuous support. After being exposed to digital tools, teachers typically find it difficult to maintain or modify these practices in their classrooms. Because of this, pedagogical change has been minimal, and digital tools are now more often utilized as a stand-in than as a cutting-edge teaching and learning tool.

Infrastructural Barriers

Teachers consistently emphasized poor internet connectivity and lack of facilities as the biggest obstacles. As one teacher from SMP Negeri 1 Parigi noted:
"The internet signal here is very weak. Sometimes it takes several minutes just to open one page, so how can we use applications that require stable connections?" (Teacher 6, SMP 1 Parigi)

Another teacher from SMA Negeri 16 Gowa shared a similar concern:
"Even though I want to try online learning platforms, the school does not have enough devices or projectors. We often share one laptop among several teachers." (Teacher 1, SMA 16 Gowa)

Limited Digital Competence

Many teachers acknowledged that they lacked confidence in using advanced digital tools. While they could manage basic applications, integrating them into pedagogy remained a challenge. One teacher explained:
"I can make PowerPoint slides, but I don't know how to use interactive applications like Quizizz or Google Classroom effectively. Without guidance, I just go back to my usual methods." (Teacher 4, SMA 16 Gowa)
This lack of competence was often linked to insufficient follow-up training, as highlighted by another participant:
"The training gives us an overview, but after that, we are left alone. If I face problems, there is no one to ask for help." (Teacher 9, SMP 1 Parigi)

Student-Related Constraints

Teachers also pointed out that students in remote areas frequently face difficulties accessing digital learning due to economic and infrastructural limitations. As one teacher explained:

"Many of my students do not have personal smartphones, and even if they do, they cannot afford enough internet data. This makes digital assignments unrealistic." (Teacher 7, SMP 1 Parigi)

Another added:
"When I try to use online platforms, only a few students can participate. Most of them prefer printed worksheets because they do not need the internet." (Teacher 5, SMA 16 Gowa)

In short, the findings show that teachers in these remote contexts face a **combination of external and internal barriers**: weak infrastructure (internet and devices), limited digital competence, and socioeconomic constraints of students. These overlapping challenges make digital adoption difficult, often forcing teachers to rely on traditional methods despite their awareness of digital learning's potential benefits.

Training model would be most effective in supporting digital literacy and pedagogical innovation in rural schools

Interviews with teachers and principals highlighted that effective training in rural contexts must be continuous, practical, and context-sensitive, rather than short, one-off workshops. Document reviews confirmed that while some training initiatives exist, most lack sustained mentoring and follow-up.

Interview Data

Teachers expressed the need for long-term mentoring instead of isolated training sessions. One teacher from SMA Negeri 16 Gowa explained:
"We need someone who can guide us step by step. If there is follow-up after the training, I believe we will be more confident to apply digital tools." (Teacher 2, SMA 16 Gowa)

Another participant from SMP Negeri 1 Parigi emphasized the importance of peer collaboration:
"Sometimes we learn better from our colleagues because they face the same problems. A training model that allows teachers to share and practice together will be very helpful." (Teacher 6, SMP 1 Parigi)

Teachers also noted that training must be adapted to rural realities, with attention to limited infrastructure:

"The training should not only teach us about advanced platforms. It must also give alternatives for places like ours with weak internet. Otherwise, we just get frustrated." (Teacher 4, SMP 1 Parigi)

In terms of infrastructure, the principal of SMP 1 Parigi emphasized that limited access to stable internet and insufficient digital equipment continue to hinder teachers' ability to fully engage in professional training and apply digital practices in the classroom. According to him, improving infrastructure alone is not enough; effective development also requires a supportive learning system that helps teachers practice and sustain new competencies. He suggested adopting a blended model of capacity building that combines formal training, mentoring, and school-based communities of practice. So, a principal suggested a blended model that combines workshops, mentoring, and school-based communities of practice:
"If teachers can join small groups at school to practice what they learn, and if there is ongoing mentoring from experts, then digital innovation will really happen." (Principal, SMA 16 Gowa)

Document Review

The majority of training programs are documented as one- to three-day workshops, according to an analysis of district and school records. Certificates of participation were included in the district education office's reports, but there were no records of ongoing mentoring or follow-up visits. Subsequent training session lesson plans also revealed few modifications, indicating that current models are not generating much pedagogical innovation.

In sum, referred to the facts and evidence from interviews and documents suggests that a mentoring-based, cooperative, and context-sensitive approach would be the most successful training model for rural schools. Instead of generic, short-term workshops, teachers prefer training that offers peer sharing, hands-on demonstrations, and ongoing support. This is further supported by document analysis, which demonstrates that the current workshop-only model has not succeeded in bringing about long-lasting pedagogical change. The result also supported by (Zeng, 2025) to work in training model in order to reach the improvement applying digital literacy specifically in rural school context .

The solutions to solve the challenges

ISSN 2686-0120 (print), 2686-5106 (online) Vol. 7., No. 2, December 2025, pp. 120-132

Interviews with teachers and principals suggested a range of possible solutions to overcome the challenges of adopting digital learning in remote contexts. These solutions can be grouped into three main themes: infrastructure improvement, teacher capacity building, and student support strategies.

Infrastructure Improvement

Many participants emphasized that reliable internet access and sufficient devices are essential. One teacher from SMP Negeri 1 Parigi stated:

"The government should prioritize internet access in rural schools. Even a stable Wi-Fi at school would help us a lot." (Teacher 7, SMP 1 Parigi)

Another teacher from SMA Negeri 16 Gowa highlighted the importance of equipment:
"We need more devices, like laptops and projectors. Sharing one device among many teachers slows us down." (Teacher 1, SMA 16 Gowa)

Teacher Capacity Building

Teachers believed that continuous training and mentoring could gradually build their confidence and competence in digital literacy. One participant suggested:
"If we have regular workshops followed by mentoring, we can keep learning and practicing. That way, the skills will stay with us." (Teacher 3, SMA 16 Gowa)

A principal emphasized peer support as part of the solution:
"A peer learning group in each school would help teachers share tips and solve problems together." (Principal, SMP 1 Parigi)

Student Support Strategies

Several teachers pointed out that solutions must also address students' limitations. One teacher explained:
"Many students cannot afford internet data. If the school can provide offline materials alongside online ones, it will reduce the gap." (Teacher 4, SMP 1 Parigi)

Another suggested collaboration with local government and communities:
"If the village office or local government can provide community internet centers, students can go there to access online learning." (Teacher 6, SMA 16 Gowa)

In sum, the findings indicated that teachers see solutions in three interconnected areas: improving infrastructure, strengthening teacher capacity, and ensuring student accessibility. Without addressing these areas simultaneously, digital adoption in rural schools will remain limited (Mustafa et al., 2024).

Discussion

Digital literacy and pedagogical change were investigated in this study at SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa, two rural schools. The answers to the five research questions point to a number of significant problems that help us comprehend the advantages and disadvantages of digital learning in remote settings.

Digital Literacy Levels and Teacher Competence

The first finding indicates that teachers at both schools have basic to intermediate level of digital literacy. The teachers' digital literacy was categorized as **basic** because their skills align primarily with fundamental or operational competencies, rather than with higher-order or pedagogical use of digital technology. Hence, in **intermediate level** where teachers at this level

were able to facilitate collaborative digital learning and integrate multiple tools to support pedagogical innovation (Vuorikari et al., 2022). For instain, they can use WhatsApp and PowerPoint, but not more complex apps like Google Classroom, Quizizz, or teamwork tools. According to recent studies, teachers in rural Indonesia are often tech-savvy but lack pedagogical innovation (Ahmad Dar & Ahmad Rather, 2021). The difference in digital proficiency, particularly between younger and more experienced teachers, emphasizes the value of continuous professional development tailored to regional needs.

Training and Pedagogical Transformation

The second research question states that current training initiatives have only partially supported pedagogical transformation. Training workshops that often raise awareness but lack depth, contextualization, and follow-up rarely result in changes to classroom practice. Similar findings were reported by .(Mutiaraningrum & Nugroho, 2021)), who noted that Indonesian teacher preparation programs are usually brief and generic, with little practical application. This highlights the need for realistic, ongoing, and mentorship-supported training models, particularly in resource-constrained rural areas

Challenges in Rural Contexts

Three main obstacles to implementing digital learning were noted by teachers: inadequate infrastructure, low levels of digital competency, and socioeconomic limitations pertaining to students. These difficulties align with international research on rural education (E & Ramani, 2025), which highlights the "digital divide" in terms of usage and skills as well as access. Despite teachers' willingness to innovate, digital adoption is still limited due to the interaction of internal (confidence, pedagogical readiness) and external (internet, devices) barriers.

Effective Training Models for Rural Schools

The fourth finding implies that the most successful model is one that is collaborative, context-sensitive, and mentoring-based, according to principals and teachers. This result is consistent with Vygotski theory in (Malik et al., 2025) an views on social learning, which emphasize the importance of peer cooperation and mentorship in teacher preparation. A review of the documents revealed that the current reliance on one-time workshops is inadequate (Ananto et al., 2024). In order to progressively close the gap between training and classroom implementation, the study thus supports calls for school-based communities of practice backed by outside experts (Sarwanti, 2018).

Solutions to Challenges

Teachers' suggestions for answers to the last research question included enhancing infrastructure, boosting teacher effectiveness, and assisting students through community cooperation and reasonably priced access. These solutions are in line with the OECD's (2021) integrated framework, which contends that systemic interventions combining technology provision, teacher development, and student equity policies are necessary to bring about digital transformation in education. The focus on offline learning options and community-based internet centers emphasizes how crucial local adaptability is to rural digital education.

Overall Implications

When combined, the results show that pedagogical innovation and digital literacy in rural schools are related problems that cannot be resolved by separate interventions. Providing devices without ongoing mentoring will not result in sustainable innovation, and increasing teacher competency without addressing infrastructure will not be successful. The study makes a contribution by demonstrating that educators themselves are cognizant of these interrelated problems and their solutions, providing a bottom-up viewpoint to support current legislative efforts (Lestari et al., 2024).

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4. Conclusion

Examining the present level of digital literacy among teachers at SMA Negeri 16 Gowa and SMP Negeri 1 Parigi Gowa, evaluating the effect of training programs on pedagogical transformation, identifying obstacles to digital learning adoption, and investigating efficient training models and solutions for promoting digital literacy in rural schools were the objectives of this study. The study offered a comprehensive understanding of how digital literacy is situated in these contexts through the use of document reviews, classroom observations, and interviews.

The results showed that although the majority of teachers are proficient in digital literacy (e.g., using PowerPoint, WhatsApp, or basic online platforms), there is still a lack of integration of sophisticated tools for interactive or collaborative learning. Although there have been training programs, their efficacy in changing classroom practices has been diminished because they are frequently brief, generic, and lack contextual adaptation. Lack of devices, poor internet access, inadequate infrastructure, and low student engagement on digital platforms are some of the ongoing issues that teachers in rural areas must deal with. Participants stated that a context-sensitive training model that prioritizes ongoing mentoring, peer collaboration, and follow-up support would be more successful than one-time workshops in spite of these limitations. They also offered doable fixes like enhancing school-community partnerships, creating more locally relevant training materials, and upgrading infrastructure.

Theoretical Implications

In theory, this study adds to the expanding body of knowledge regarding digital literacy in the classroom, especially in settings with limited resources and those in rural areas. It highlights that digital literacy is a pedagogical and contextual practice that is influenced by local circumstances, confidence, and accessibility in addition to being a technical skill. By demonstrating how rural realities necessitate a translation of theory into practice, this reinforces and expands on current frameworks of digital pedagogy.

Practical Implications

Practically, Policymakers, school administrators, and teacher educators can use the study's insights to create training programs that are more pertinent. Continuous and cooperative forms of professional development should be given priority over one-size-fits-all models. The results also emphasize how crucial it is to spend money on digital resources and infrastructure in order to give this kind of training purpose and sustainability.

Contribution to Education and English Teaching

For education in general, this study emphasized the necessity of synergy system that formed incorporation between structural support and capacity-building. The results clearly showed that teachers' proficiency with digital platforms can significantly improve student engagement, exposure to real materials, and interactive communication in the particular context of teaching English. English classrooms in rural areas can changes from textbook-centered to more interactive, communicative, and globally connected environments that satisfy the demands of 21st-century learning by improving teachers' digital competency. In summary, this study provides theoretical insights and practical guidance for enhancing teacher development, pedagogical innovation, and the general standard of English instruction in the digital age, in addition to identifying the current realities and difficulties of digital literacy in rural Indonesian schools.

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