Teacher Education and Curriculum Studies
2026, Vol. 11, No. 2, pp. 54–62
https://doi.org/10.11648/j.tecs.20261102.12

SciencePG
Science Publishing Group

Research Article

Understanding the Digital Divide Through Rural Teachers' Lived Experiences: Implications for Digital Literacy and Teaching Efficacy

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Abstract

Digital technologies have become widely used in education, yet disparities between rural and urban schools persist. In rural contexts, teachers often face unstable equipment, limited technical support, and heavy workloads. However, few studies have explored how these challenges are experienced in everyday teaching. This study examined how the digital divide shaped rural teachers' classroom experiences, digital literacy, and professional efficacy. A qualitative design was adopted, with semi-structured interviews conducted with eight rural primary and secondary school teachers, and the data were analyzed using thematic analysis. The findings revealed three key themes. First, the digital divide was not experienced as a lack of devices, but as contextual classroom constraints related to infrastructure instability, insufficient technical support, and time pressure. Second, although teachers possessed basic operational skills, many hesitated to use digital tools in everyday teaching due to concerns about classroom control and technical uncertainty. Third, repeated technological disruptions undermined teachers' sense of efficacy and shaped more cautious instructional choices. Overall, the study shifts the understanding of the digital divide from access and skills toward the role of contextual constraints and their impact on rural teachers' professional efficacy in classroom practice. Improving digital teaching therefore requires not only stable infrastructure and timely technical support, but also attention to teachers' lived classroom experiences.

Keywords

Digital Divide, Rural Teachers, Digital Literacy, Teacher Efficacy, Qualitative Study

1. Introduction

The integration of digital technologies into education has changed how teaching and learning take place in schools. Digital tools are increasingly used to support instruction, improve efficiency, and enable more interactive learning [1, 2]. However, these changes have not developed evenly across different contexts. In particular, rural schools continue to face limitations in infrastructure, technical support, and resource availability, which affect how digital technologies are used in everyday teaching. As a result, differences between rural and urban education remain evident in both access to and effective use of digital tools [3].

Although digital inequality in education has received increasing attention, existing research has mainly focused on

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Received: 29 March 2026; **Accepted:** 13 April 2026; **Published:** 23 April 2026

students, learning outcomes, or institutional conditions. Less attention has been paid to teachers, especially those working in rural schools. As key agents of classroom practice, teachers are not only users of digital tools but also decision-makers in how these tools are applied in teaching. In rural contexts, teachers often work under constrained conditions, including limited training opportunities, insufficient technical support, and heavy workloads. These factors shape how they engage with digital technologies in their daily teaching.

Previous studies have shown that teachers' digital literacy is important for technology integration. However, having basic operational skills does not necessarily lead to regular or effective classroom use. In rural schools, teachers may still hesitate to use digital tools despite being able to operate them. This suggests that the digital divide at the teacher level is not only related to access or skills. It is also shaped by classroom conditions and teachers' confidence in using technology. However, limited research has examined how rural teachers experienced these challenges in real classroom settings. It is also unclear how digital literacy and professional efficacy interacted to shape their use of technology.

To address this gap, this study examined how the digital divide shapes rural teachers' experiences and perceptions of technology use in teaching. It focused on how limited access to resources, insufficient training, and contextual constraints influence teachers' digital literacy and professional efficacy, and how these factors interact in classroom practice. Specifically, the study addressed the following questions:

(1) How do rural teachers perceive and experience the digital divide in their professional practice?

(2) In what ways do digital literacy and professional efficacy interact to influence their use of digital technologies in teaching?

1.1. The Development of the Digital Divide

Early discussions of the digital divide were primarily grounded in access-based explanations. Scholars emphasized unequal access to digital devices, internet connectivity, and technological infrastructure as the key determinants of digital participation [4, 5]. This perspective provided the foundational framework for understanding how material access constrained individuals' opportunities to engage with technology.

As digital technologies became deeply embedded in social, civic, and educational life, researchers argued that access alone could not fully explain persistent disparities [6]. As digital technologies became more widespread, researchers introduced a skills-oriented perspective. They argued that differences in digital literacy, operational abilities, and information-handling skills continued to influence how individuals used technology even when access was no longer a barrier [7, 1]. This stage focused on meaningful engagement, rather than simple access, which was essential for ensuring the benefits of technology.

Building on this evolution, research further shifted attention to how people used technology and what outcomes it produced. This perspective emphasized that unequal outcomes of technology use were shaped by broader social and institutional conditions, not merely differences in access [8-10]. Factors such as socioeconomic status, cultural differences, and institutional support increasingly explained why digital participation varied across groups.

In educational contexts, studies showed that disparities persisted because there were still differences in pedagogical support, school culture, and technology integration practices [11, 12]. Research also highlighted that school-level conditions significantly shaped how digital inequalities were reproduced in classroom practices [13]. Although many studies had examined students and educational systems more broadly, little was known about how digital divides shaped teachers' perceptions and experiences in rural or under-resourced contexts, which remained a significant gap in existing research. In this study, the digital divide is conceptually framed through three interrelated dimensions—access, skills, and outcomes— providing a structured lens to examine how inequalities are manifested in teachers' classroom practices.

1.2. Rural Teachers' Digital Divide

Research on the digital divide increasingly recognized that rural teachers encountered persistent and distinctive challenges within digitalized educational systems [9, 14]. Existing studies showed that rural teachers faced challenges that extended beyond limited access to technology [1]. These challenges often stemmed from broader structural barriers in their schools, mostly in three dimensions: resource constraints, school culture, and teachers' self-motivation.

Regarding the resource perspective, researchers reported that rural schools often lacked stable internet connectivity, updated devices, and sustained technical support, which fundamentally limited teachers' opportunities to engage with digital tools in daily instruction [7, 14]. Even when access was available, rural teachers often received limited institutional support, including fewer opportunities for professional development and less meaningful digital teaching guidance [15, 16].

When it came to school culture, studies showed that rural teachers often possessed relatively low levels of digital literacy. Their use of technology was usually restricted to basic, tool-based operations rather than flexible or instructional applications [17, 18]. These skill gaps were influenced not only by limited training but also by differences in school culture, teacher expectations, and peer collaboration [13]. As a result, rural teachers had fewer opportunities to build the high-level skills to integrate technology effectively into instruction.

From the perspective of teachers' self-motivation, studies showed that rural teachers often relied on basic forms of technology, such as presenting slides or using online materials. They seldom had opportunities to apply digital tools in more engaging or student-centered instructional activities [19, 20]. These patterns reflected deeper institutional and contextual

constraints, including heavy teaching workloads, limited autonomy, and the absence of clear pedagogical guidance for integrating technology into teaching.

These studies showed that rural teachers' digital divide was shaped by structural, cultural, and pedagogical factors, leading to inequalities in access, skills, and technology use. However, despite growing recognition of these disparities, few studies had examined how rural teachers themselves interpreted and navigated these challenges in their professional practice. This highlighted the need for more context-sensitive investigations into rural teachers' lived experiences.

1.3. The Impact of the Digital Divide on Teachers' Digital Literacy

Research increasingly showed that the digital divide had a direct influence on teachers' digital literacy [17]. This influence became more evident in contexts where access to technology and professional training was uneven. Studies indicated that teachers working in resource-constrained or rural contexts often acquired narrower forms of digital competence [3, 21].

Studies consistently showed that limited access to digital resources restricted teachers' opportunities to develop essential digital literacy. Teachers with unstable connectivity, outdated devices, or minimal technical support often used digital tools only for basic tasks, such as presenting content or accessing materials [7, 22]. These constraints limited teachers' opportunities to explore and, as a result, restricted the development of higher-order digital literacy for adaptive teaching.

Beyond access-related constraints, studies increasingly emphasized that school-level structures and cultural expectations also played a crucial role in shaping teachers' digital literacy [18, 23]. School-level expectations, leadership support, and opportunities for peer collaboration substantially influenced whether teachers developed more advanced forms of digital literacy [12, 13]. When such support was lacking, teachers remained at a basic level of digital engagement.

1.4. The Impact of the Digital Divide on Teachers' Efficacy

While previous studies had examined the relationship between the digital divide and teachers' digital literacy, they also suggested that digital inequalities might affect teachers' confidence and sense of capability, pointing to the importance of teacher efficacy [24]. Drawing on social cognitive theory, teacher efficacy is understood as teachers' beliefs in their capability to effectively use digital tools under specific contextual conditions.

Digital inequality influenced teachers' efficacy through multiple pathways. First, unstable infrastructure and lack of technical support reduced teachers' sense of control when using digital tools [14, 25]. Second, digital inequality limited opportunities for training and practical use of technology, making it difficult for teachers to move beyond basic applications [15, 28]. Teachers' beliefs about technology also influenced how they used digital tools, which in turn affected their sense of efficacy [26]. Beyond individual skills and resources, school culture and institutional expectations further shaped teachers' sense of efficacy. Research suggested that supportive leadership, collaborative environments, and clear policies enhanced teachers' confidence in technology integration [11, 27]. In contrast, when such support was lacking, teachers became less confident about adopting new approaches.

Together, these findings showed that the digital divide created both structural and psychological pressures for teachers. However, few studies had examined how rural teachers themselves understood these pressures or how digital inequalities influenced their everyday teaching.

1.5. Theoretical Framework

This study applies Bandura's Self-Efficacy Theory as the guiding theory. This theory expounds people's beliefs in their own capability to successfully perform a task. It is not mainly about what people objectively know, but about whether they believe they can organize and carry out the actions needed to achieve a desired result.

According to Bandura, self-efficacy plays a central role in shaping how individuals think, feel, and act when facing challenges. Individuals with higher self-efficacy are more likely to engage in difficult tasks, persist in the face of obstacles, and recover from setbacks, whereas those with lower self-efficacy tend to avoid challenges, experience anxiety, and withdraw more easily.

Bandura proposes that self-efficacy develops mainly from four sources. The first is mastery experiences, meaning one's own successful performance. The second is vicarious experiences, meaning seeing others like oneself succeed. The third is verbal persuasion, such as encouragement, feedback, and support from others. The fourth is physiological and emotional states, such as stress, anxiety, confidence, or frustration.

Rural teachers' digital literacy and teaching efficacy are not determined only by access to technology. They are also shaped by whether teachers believe they can use digital tools effectively in teaching. That is exactly where self-efficacy theory becomes useful.

If rural teachers have limited access to devices, unstable internet, little training, or weak institutional support, they may have fewer successful digital teaching experiences. They may also have fewer peer models to learn from and less encouragement from schools. As a result, their digital self-efficacy may remain low. Once self-efficacy is low, teachers may feel less confident in integrating technology into lessons, less willing to experiment, and less likely to persist when technical problems occur. Over time, this affects both their digital literacy development and their teaching efficacy.

So in my study, Bandura's theory helps explain the psychological mechanism between the rural digital environment and teachers' classroom practice. The digital divide framework explains the structural inequality. Self-efficacy theory explains how those unequal conditions are translated into teachers' beliefs, confidence, and actions.

1.6. Research Gap

Taken together, existing research showed that the digital divide shaped teachers' digital literacy and efficacy through multiple pathways, including unequal access, limited training, and gaps in institutional support. However, current studies rarely explored teachers' own interpretations or the day-to-day experiences behind these disparities.

This gap highlighted the need for research that examined rural teachers' lived experiences within the digital divide and how they navigated these challenges in practice.

2. Methodology

2.1. Participants

Ethical approval for this study was obtained from the relevant institutional review board prior to data collection. All participants were informed of the study's purpose and provided written consent.

Participants were recruited through purposive sampling to ensure that they were rural teachers with direct experience in digital teaching. A total of eight teachers participated in the study, and their demographic information is presented in Table 1.

Table 1. *Participant Demographic Information.*

Participant	Gender	Age	Qualification	Teaching Experience	Subject	Grade	Admin Role
T1	Male	27	Junior Teacher	3	English	6	Head Teacher
T2	Male	28	Intermediate Teacher	5	Chinese	7	Head Teacher
T3	Female	31	Intermediate Teacher	8	English	5&8	Clerk of Teaching Affairs Office
T4	Male	36	Intermediate Teacher	14	Math& English	7	Clerk of Teaching Affairs Office
T5	Female	53	Senior Teacher	35	Chinese	8	
T6	Male	32	Junior Teacher	8	History&Geography	6	Head Teacher
T7	Female	32	Junior Teacher	11	English	4	Head Teacher
T8	Male	40	Senior Teacher	22	Math& physics	9	Director of Teaching Affairs Office

All participants worked in rural primary or secondary schools, had at least two years of teaching experience, and had used digital tools in their classroom instruction.

2.2. Research Design

This study adopted a qualitative research design to explore how teachers interpret and make sense of their experiences within specific social contexts [29]. Such an approach is particularly suitable for examining teachers' perceptions of the digital divide.

A qualitative approach also allows the researcher to examine how teachers express and interpret their experiences of the digital divide in their everyday professional practice [29]. This is important because these experiences are shaped not only by technological conditions but also by school culture, expectations, and professional identity.

2.3. Data Collection

Data were collected through semi-structured interviews. This method allowed participants to express their experiences in their own words while maintaining a clear focus on the research questions. It provided a flexible structure that enabled teachers to introduce issues that the researcher may not have anticipated but that were important for understanding their digital practices [30].

The interview protocol was developed based on established

qualitative interview design frameworks [31]. The interview guide included questions on teachers' perceptions of the digital divide, their experiences with digital resources, changes in their digital literacy, and how digital conditions shaped their teaching decisions.

Interviews lasted 45–60 minutes and were conducted either face-to-face or online depending on participants' schedules and school constraints. All interviews were audio-recorded with consent and transcribed verbatim.

2.4. Data Analysis

The interview data were analyzed using thematic analysis, following Braun and Clarke's (2006) six-phase framework [32]. First, the researcher familiarized herself with the data through repeated reading of the interview transcripts. Second, initial codes were generated to capture meaningful features of the data. Third, the codes were organized into potential themes. Fourth, the themes were reviewed and refined to ensure internal consistency. Fifth, the themes were defined and named. Finally, the themes were interpreted to reflect their conceptual meanings.

Thematic analysis was appropriate for this study because it allows the researcher to examine both common patterns and contextual variations in teachers' experiences. It also enables the researcher to move beyond description to interpret how the digital divide shapes rural teachers' professional practices [32, 33].

3. Findings

Theme 1: A Contextual Digital Divide in Rural Schools: Equipment, Support, and Time Constraints

Across the interviews, most teachers (7 out of 8) described the digital divide not as a lack of devices, but as difficulties encountered in using them during everyday teaching. Although participants acknowledged that digital facilities had improved in recent years, especially in terms of classroom hardware, these improvements did not consistently result in stable or confident use. Instead, teachers reported that the digital divide was experienced through problems related to equipment limitations, lack of on-site technical support, and constraints on time and energy.

One major issue raised by participants was the instability and incompatibility of digital infrastructure in real classroom settings. As digital devices in rural schools were often upgraded in phases rather than simultaneously, six teachers reported that devices often worked during lesson preparation but became unreliable once the class began. Tools that appeared functional in advance sometimes lagged, froze, or responded differently in actual teaching situations. As one teacher explained, "The equipment looks fine when I prepare, but once the class starts, it may freeze or respond very slowly, which interrupts the lesson" (T3). As a result, teachers found it difficult to integrate digital tools smoothly into lesson flow.

In addition to equipment issues, most teachers (6 out of 8) emphasized the lack of immediate technical support as a major challenge. When technical problems occurred, teachers usually had to deal with them on their own, often in front of students. Several participants described situations where digital activities had to be stopped because the problems could not be solved quickly. In these cases, teachers often returned to familiar teaching methods to keep the lesson going. One teacher noted, "When something goes wrong and no one can help, I just go back to the blackboard or slides to make sure the class can continue" (T5).

Time pressure and heavy workload were also frequently mentioned as factors that limited teachers' use of digital tools. Five teachers explained that preparing technology-supported lessons required additional time for planning, testing, and backup design. However, unexpected technical problems still occurred during lessons, which further increased time pressure. Under tight schedules and exam-oriented teaching demands, teachers reported that it was difficult to sustain such efforts in everyday practice. As one participant stated, "Even if the activity is useful, the preparation takes too much time, and it is hard to use it in every lesson" (T7).

Taken together, teachers described the digital divide as a practical difficulty embedded in their daily teaching rather than a simple issue of access.

Theme 2: Digital Literacy as Both an Enabler and a Constraint of Teacher Agency

Building on the contextual constraints described in Theme 1, teachers also reflected on how their own digital literacy shaped their use of technology in classroom practice. Across the interviews, most participants (7 out of 8) reported that they were able to operate basic digital tools and learn new applications when needed. Several teachers (5 out of 8) described themselves as capable of using interactive whiteboards, digital platforms, or AI-assisted tools, especially for lesson preparation or demonstration purposes. As one teacher noted, "Basic things are not a problem—I can learn them if I really need to" (T2). These accounts indicated that teachers generally possessed the necessary operational skills to engage with digital technologies.

However, this level of competence did not consistently lead to regular use in everyday teaching. Six teachers described a clear gap between being able to use digital tools and actually using them in class. Although they were familiar with how digital tools worked, they remained cautious about applying them in real-time teaching situations. This hesitation was particularly evident when lessons required student interaction or when the pace of teaching needed to be tightly controlled. As one teacher explained, "It's not that I don't know how to use it, but once something goes wrong in class, it's hard to control" (T4).

Teachers' decisions about whether to use digital tools were closely related to how manageable these tools appeared in classroom situations. Several participants (4 out of 8) reported

that digital tools brought uncertainty into lesson flow, especially when time was limited or when students needed close guidance. In such situations, teachers preferred to use familiar methods that allowed them to maintain control of the lesson. One teacher stated, "When time is tight, I would rather use something I am familiar with than try something new and risk delays" (T6). Another participant noted that digital tools were often used in demonstration lessons but were less common in everyday teaching (T8).

As a result, teachers' digital literacy functioned as a conditional resource rather than a guarantee of classroom use. While their skills allowed them to recognize the potential value of digital tools, actual use depended on whether these tools could be applied without disrupting lesson flow. This gap between competence and use formed an important link between the contextual challenges described in Theme 1 and the patterns of confidence and decision-making observed in subsequent teaching practices.

Theme 3: The Efficacy Loop: How Digital Conditions Shaped Teachers' Emotions, Confidence, and Pedagogical Choices

Following the patterns described in Theme 2, teachers further described how their experiences with digital tools affected their emotions and teaching decisions over time. Across the interviews, most participants (6 out of 8) described strong emotional reactions when digital tools failed during lessons. Problems such as system lag, frozen screens, or mismatched audio and visuals often caused immediate anxiety and a sense of losing control. As one teacher recalled, "I felt very nervous when the activity didn't work as planned, and it became hard to keep the class focused" (T1). Another participant described such situations as "very frustrating" because students' attention quickly shifted away from teaching content (T3).

These repeated disruptions gradually influenced teachers' confidence in using digital tools. Five teachers reported that after experiencing several failed attempts, they began to doubt whether they could manage technology-supported teaching effectively in real classrooms. This doubt was not mainly about lacking technical skills, but about the unpredictability of classroom situations. As one teacher stated, "After several failures, I felt that this kind of teaching was not really suitable for my class" (T6).

As confidence declined, teachers adjusted their teaching choices to reduce uncertainty. Most participants (6 out of 8) reported that they limited their use of digital tools in everyday lessons and relied more on familiar and stable methods. These methods were seen as more controllable and less likely to interrupt lesson flow. One teacher explained, "Stability is more important in daily teaching. I need to make sure the class goes smoothly" (T5). As a result, digital tools were often used only for basic display functions rather than for interactive or student-centered activities.

Some teachers also described positive experiences where digital tools worked well and supported lesson goals. In these cases, teachers reported feeling more confident and willing to try similar approaches again. As one participant noted, "When it works well, I feel more confident that this method can be useful" (T7). However, these positive experiences were often limited to specific situations, such as well-prepared lessons or demonstration classes, and did not always lead to sustained use in everyday teaching.

Taken together, these accounts showed a repeating pattern in teachers' experiences. Technical problems led to negative emotions, which reduced confidence and resulted in more cautious teaching decisions. These decisions, in turn, limited opportunities for successful digital use, making it difficult for teachers to build stable confidence over time.

4. Discussion

This study explored how rural teachers experienced the digital divide and how these experiences were connected to digital literacy and teaching efficacy in everyday classroom contexts. The findings suggested that digital inequality was not perceived as a simple lack of access to technology, but as classroom-embedded constraints related to infrastructure reliability, technical support, and time constraints. These contextual conditions shaped not only teachers' use of digital tools, but also how digital environments influenced their beliefs, emotions, and instructional choices over time.

The findings of this study indicated that the digital divide in rural schools was experienced primarily as a problem of classroom reliability rather than simple technological access. Teachers did not describe technology as absent, but as difficult to depend on during real lessons. This aligned with previous research suggesting that access to digital infrastructure did not necessarily lead to meaningful or effective classroom use [4, 5]. Prior studies had also shown that inequalities in educational technology were often related to usability, implementation conditions, and institutional contexts rather than the mere availability of devices [22, 25].

The findings further suggested that this gap between access and use became particularly visible in rural classrooms due to the instability of digital infrastructure, the lack of immediate technical support, and the time constraints faced by teachers. First, teachers in this study frequently encountered inconsistencies between preparation environments and classroom systems. Digital materials or tools that functioned normally during lesson preparation did not always operate reliably on classroom platforms, making the performance of technology during live instruction less predictable. Second, many rural schools lacked readily available technical personnel to address technical issues. When breakdowns occurred during lessons, teachers often had to manage them independently, which increased the practical cost of using digital tools in everyday teaching.

Third, teachers in rural schools commonly carried multiple responsibilities beyond subject teaching, including administrative duties and student management. These overlapping roles limited the time available for testing, troubleshooting,

and refining technology-supported lessons. Under such conditions, reliability became more important than innovation. Digital tools were therefore evaluated less for their pedagogical potential and more for whether they could operate smoothly without interrupting lesson flow.

Besides the contextual constraints discussed earlier, the findings also indicated that teachers' digital literacy did not automatically translate into sustained classroom use. While most participants reported being able to operate digital tools and learn new applications, their decisions to use technology in everyday teaching depended largely on whether digital use appeared manageable within real classroom conditions.

Previous research had often treated digital literacy as an individual capacity that supported more effective technology use and stronger teacher agency [8, 11, 12]. However, the present study suggested that this relationship was not straightforward in rural teaching contexts. Although most teachers possessed basic operational skills, their actual use of digital tools depended on whether these tools could be used reliably and without disrupting classroom teaching. In this sense, digital literacy alone was not sufficient to ensure regular or confident use.

Several classroom pressures helped explain this gap between competence and regular use. Teachers described concerns about interruptions to lesson progress and the difficulty of regaining students' focus after technical problems. In exam-oriented environments, lesson pacing was tightly structured, and even short disruptions could carry instructional consequences. Under such conditions, familiar teaching methods were often preferred because they offered greater predictability, even when teachers recognized the potential instructional value of digital tools.

The findings indicate that rural teachers' challenges extended beyond limited access to include insufficient training, weak technical support, and a lack of sustained opportunities for digital practice. These constraints not only restricted the development of digital skills, but also limited teachers' opportunities to accumulate successful experiences with technology in classroom settings.

With fewer successful experiences, teachers reported a reduced sense of control during instruction and increasing uncertainty when using digital tools. This weakened their confidence in integrating technology into everyday teaching, leading to more cautious instructional decisions and avoidance of digital tools in routine practice. As a result, opportunities to further develop digital competence were reduced, reinforcing the initial constraints over time. This process highlights that teaching self-efficacy plays a central role in explaining how contextual limitations are translated into teachers' instructional behavior, linking differences in access and skills to variations in classroom practice.

Empirical evidence from the data supported this pattern. When digital tools malfunctioned during lessons, teachers frequently reported frustration and declining confidence in managing technology-supported instruction. Lower confidence often resulted in avoidance of digital tools in everyday teaching, limiting opportunities for skill development and positive reinforcement. Although successful experiences occasionally enhanced teachers' confidence, these were typically confined to specific contexts, such as demonstration lessons and did not translate into sustained use in everyday teaching.

These findings could be interpreted in relation to research on teacher self-efficacy, which emphasized the role of successful experiences in building instructional confidence. However, the present study suggested a different pattern in rural contexts. Because digital systems were often unstable, teachers experienced repeated minor failures rather than consistent success. Repeated disruptions limited teachers' chances to successfully use digital tools during lessons, which in turn weakened teachers' confidence and made them more cautious in using digital tools.

5. Implications and Limitations

5.1. Implications

Several practical implications emerge for improving digital teaching in rural contexts, particularly in relation to infrastructure, institutional support, and working conditions.

First, school leadership and education administrators should shift the focus of infrastructure investment from the quantity of devices to classroom readiness. Compatibility across platforms, stable system performance during live lessons, and consistency between preparation and classroom environments are more important for meaningful use.

Second, educational authorities and school management should recognize technical support as a pedagogical necessity rather than a purely technical service. When breakdowns occur during lessons, the absence of timely assistance increases instructional disruption and discourages teachers from attempting digital approaches. Allocating dedicated technical personnel or establishing rapid-response support mechanisms can reduce the practical risks associated with digital teaching in rural schools, where staff numbers are limited and technical expertise is not always available on campus. This aligned with previous research emphasizing that sustained institutional support is essential for teachers' continued engagement with digital practices [11].

Third, policymakers and school administrators need to recognize time as a structural condition for digital innovation. Heavy workloads and rigid schedules limit teachers' ability to test, adapt, and refine technology-supported lessons. Reducing non-instructional workload and allowing space for trial and error may be as important as providing training. This finding echoed prior research indicating that teachers' adoption of technology is closely tied to working conditions and organizational support [12].

5.2. Limitations

This research is subject to several limitations. First, it draws on a relatively small qualitative sample, which may limit the generalizability of the findings. Second, the study relies on self-reported data rather than classroom observations, which may not fully capture teachers' actual practices. Third, the focus on rural contexts limits direct comparison with urban settings that have different resource structures.

Future research could address these limitations by including larger and more diverse samples, incorporating observational data, and examining how changes in institutional support influence teachers' digital practices over time.

6. Conclusion

The present study examined how rural teachers experience the digital divide in their everyday classroom practice and how these experiences relate to digital literacy and teaching efficacy. The findings suggested that narrowing the digital divide in education requires attention not only to technological provision but also to the institutional, organizational, and temporal conditions that shape teachers' daily decisions.

By foregrounding rural teachers' perspectives, this study contributed to a more nuanced understanding of digital inequality in education and highlighted the importance of addressing contextual constraints in promoting meaningful technology integration.

Author Contributions

Song Xiangyu: Conceptualization, Methodology, Investigation, Formal Analysis, Writing – original draft, Writing – review & editing

Conflicts of Interest

The author declares no conflicts of interest.

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Research Field

Song Xiangyu: digital divide, rural education, digital literacy, teacher efficacy, technology integration, qualitative research