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TEACHERS' PERCEPTIONS OF SCHOOL READINESS FOR EDUCATIONAL DIGITAL TRANSFORMATION AT SMPN 6 ONE ROOF BAHOROK

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Abstrak

Transformasi digital pendidikan menuntut sekolah mampu mengintegrasikan teknologi secara adaptif, namun sekolah di wilayah rural masih menghadapi keterbatasan infrastruktur, kompetensi, dan dukungan kebijakan. Penelitian ini bertujuan menganalisis persepsi guru terhadap kesiapan SMPN 6 Satu Atap Bahorok dalam menghadapi transformasi digital, khususnya pada dimensi infrastruktur, kompetensi sumber daya manusia, dan dukungan kebijakan sekolah. Penelitian menggunakan pendekatan kualitatif deskriptif dengan teknik pengumpulan data melalui wawancara mendalam, observasi lapangan terhadap kondisi jaringan dan perangkat, serta studi dokumentasi inventaris teknologi informasi dan komunikasi sekolah. Data dianalisis melalui reduksi data, penyajian data, verifikasi, dan pengodean tematik, sedangkan keabsahan data dijaga melalui triangulasi sumber, triangulasi teknik, member checking, dan diskusi sejawat. Hasil penelitian menunjukkan adanya fenomena “kesiapan mental yang terhambat fasilitas”: guru memiliki sikap positif terhadap urgensi teknologi, tetapi kesiapan operasional sekolah masih rendah karena jaringan internet tidak stabil, pasokan listrik sering terganggu, perangkat terbatas, dan pelatihan belum berkelanjutan. Temuan ini menegaskan bahwa transformasi digital di sekolah rural memerlukan intervensi afirmatif berupa penguatan infrastruktur energi dan internet, pelatihan kontekstual, fitur pembelajaran luring, serta kolaborasi sekolah dengan pemerintah daerah dan mitra eksternal untuk memastikan kesetaraan digital.

Kata Kunci: Transformasi Digital; Kesiapan Sekolah; Persepsi Guru; Pendidikan Rural; Kesetaraan Digital



Abstract

Digital transformation in education requires schools to integrate technology adaptively, yet rural schools continue to face limitations in infrastructure, competency, and policy support. This study analyzes teachers' perceptions of SMPN 6 Satu Atap Bahorok's readiness for digital transformation, focusing on infrastructure, human resource competency, and school policy support. Employing a descriptive qualitative approach, data were collected through in-depth interviews, field observations of network and device conditions, and documentation of the school's information and communication technology inventory. Data were analyzed through data reduction, data display, verification, and thematic coding, while trustworthiness was ensured through source triangulation, technique triangulation, member checking, and peer debriefing. The findings reveal the phenomenon of "mentally ready but facility constrained": teachers demonstrate positive attitudes toward the urgency of technology, but the school's operational readiness remains low because of unstable internet connectivity, frequent electricity disruptions, limited devices, and unsustained training. These findings indicate that digital transformation in rural schools requires affirmative interventions, including strengthened electricity and internet infrastructure, contextual teacher training, offline learning features, and collaboration among schools, local governments, and external partners to ensure digital equity.

Keywords: Digital Transformation; School Readiness; Teacher Perception; Rural Education; Digital Equity

INTRODUCTION

Digital transformation in the educational ecosystem refers to the integration of digital technology into the planning, implementation, evaluation, and governance of learning. This process concerns not only the use of devices but also shifts in the way schools produce, manage, and distribute knowledge. In the Indonesian context, the digitalization agenda has been reinforced through the Merdeka Curriculum and the Merdeka Mengajar Platform (PMM), which require teachers to access learning resources, design concrete teaching actions, and develop more flexible instructional practices. However, digitalization in education has not always progressed evenly, as rural schools continue to face limitations in network access, devices, electricity, and technical support. This digital divide makes digital transformation not merely a technical issue but also a matter of educational justice, determining whether students in remote areas can access learning opportunities equal to those available to students in urban settings.

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SMPN 6 Satu Atap Bahorok in Langkat Regency, North Sumatra, represents a rural school context shaped by both geographical and social challenges. Its distance from service centers makes internet access, device maintenance, and electricity stability daily concerns that directly affect learning processes and educational administration. In such a situation, teachers are not only expected to master learning applications but must also develop adaptive strategies to keep instruction running when the signal weakens, electricity fails, or school devices cannot be used. Therefore, school readiness must be understood as a multidimensional construct that includes infrastructure availability, teacher competency, leadership support, school policy, a culture of collaboration, and teachers' psychological capacity to manage pressures arising from systemic limitations.

Normatively, efforts to expand knowledge and use technology can be understood in line with the message of Surah Ar-Rahman verse 33 concerning the importance of power or “sultan”, which in some interpretations is understood as knowledge, capability, and authority that enable human beings to explore the boundaries of knowledge. In the educational context, this interpretation is not intended as a deterministic claim about technology, but as an ethical foundation that knowledge and digital tools should be used for public benefit, equitable access, and the strengthening of human dignity. Thus, digital transformation in rural schools must not detach students from their local identity, religious values, and community culture. Technology should instead be positioned as a means of broadening learning horizons while preserving character, humanistic communication, and multicultural values that form the foundation of national education.

Previous studies have extensively addressed the importance of educational technology, digital literacy, and teacher readiness, yet they remain limited in explaining how teachers in rural schools interpret school readiness when their motivation to change is not aligned with infrastructural capacity. This gap is important because digitalization policies designed in general terms often fail to fully capture the local realities of schools experiencing “digital poverty”. Against this background, this study aims to analyze teachers' perceptions of school readiness for digital transformation at SMPN 6 Satu Atap Bahorok. The study focuses on three main dimensions: infrastructure readiness, human resource competency, and policy support, while also identifying the adaptive strategies developed by teachers to maintain learning continuity amid limited facilities.

LITERATURE REVIEW

School Readiness Paradigm in the Digital Ecosystem

School readiness for digital transformation is a concept that extends beyond the ownership of technological devices. It encompasses infrastructure adequacy, teacher competency, school leadership, policy support, data governance, and a culture of

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innovation. Mhlanga (2024) emphasizes that the implementation of digital education in developing countries is often constrained by poverty, inequality, limited electricity, low technology access, and weak national policy. Within this framework, rural schools face a double burden: they are expected to follow the pace of national digital policies while not always possessing adequate material conditions (From, 2017). Therefore, any analysis of school readiness must position infrastructure as a fundamental prerequisite rather than merely a supporting variable.

Digital Divide and Rural Education

The digital divide in rural areas emerges through unequal access to networks, devices, skills, and technical support. Azionya and Nhedzi (2021) show that device quality, network coverage, socioeconomic status, and digital competency may limit participation in online learning. Such findings are relevant to the Bahorok context, where teachers and students do not always have equal access to stable internet and devices. Studies on rural schools also affirm that technological challenges do not stand alone; they are connected to data costs, distance from service centers, limited device maintenance, and dependence on weather conditions or electricity supply (Harsari et al., 2020; Moh Zulfan Sauqi et al., 2026).

Teacher Competency and the TPACK Framework

Teacher competency in digital transformation can be understood through the Technological Pedagogical Content Knowledge (TPACK) framework, which integrates technological, pedagogical, and content knowledge. Mishra and Koehler (2006) position TPACK as a framework for understanding teachers' capacity to design instruction that combines technology with pedagogical purposes and subject matter substance. However, in rural schools, technological competency cannot be separated from context. Sepadi, Kgaphola, and Molapo (2025) show that rural teachers face interrelated limitations in technological knowledge, training, devices, and infrastructure. Accordingly, strengthening TPACK must be accompanied by infrastructure support and training that is responsive to local conditions.

Humanistic Perspective and Islamic Educational Values

The integration of technology in education must continue to preserve the human dimension. Through humanistic learning theory, Rogers (1969) emphasizes the importance of empathetic relationships, respect for learners' experiences, and meaningful learning. In the context of Islamic education, educational modernization should be directed toward strengthening morality, social responsibility, and public benefit rather than merely pursuing technical efficiency. Therefore, digital transformation at SMPN 6



Satu Atap Bahorok needs to position technology as a facilitator that expands learning access while maintaining teacher-student communication, local wisdom, and multicultural values. This perspective is important so that digitalization does not become an administrative burden that diminishes the depth of educational relationships.

Emotional Regulation and Teacher Work Motivation

Digital readiness also has a psychological dimension. Teachers who face unstable electricity, damaged devices, and weak networks require emotional regulation so that their teaching motivation is not eroded. Putra, Simaremare, and Dina (2024) explain that emotional regulation is positively related to teachers' work motivation; thus, the ability to manage frustration becomes an important resource in facing the pressures of change. In the rural school context, emotional regulation should not be placed entirely on individual teachers, because the sources of pressure often originate from structural limitations. Principal support, a collaborative culture, and policies that provide room for flexibility are factors that help teachers maintain professional resilience (Ahadiyyah et al., 2024; Saputro & Arif, 2025).

Synthesis of the Research Gap

The literature indicates that digital transformation in education requires a combination of infrastructure, competency, leadership, and policy support. However, there remains a need for studies that specifically describe how teachers in rural schools interpret school readiness when they already possess awareness and willingness to change but are constrained by operational conditions. This study fills that gap by positioning teachers' perceptions as the main source of data. By examining the experiences of teachers at SMPN 6 Satu Atap Bahorok, this study not only describes technical problems but also reveals the relationship among motivation, emotional regulation, adaptive strategies, and the need for more affirmative policy interventions for rural schools.

RESEARCH METHODS

This study employed a qualitative approach with a descriptive-exploratory design. This approach was selected because the purpose of the study was not to measure readiness quantitatively, but to understand the meanings, experiences, and perceptions of teachers regarding school readiness for digital transformation. The research site was SMPN 6 Satu Atap Bahorok, Langkat Regency, North Sumatra. Research participants were determined using total sampling of teachers actively serving at the school, with additional supporting information obtained from administrative staff directly involved in the use of the school's digital systems. Data were collected through in-depth interviews, field observations of network stability, electricity conditions, and device use,



as well as documentation of the school's information and communication technology inventory.

Data analysis followed the model of Miles, Huberman, and Saldaña (2014), consisting of data condensation or reduction, data display, and conclusion drawing/verification. Technically, interview data were transcribed, read repeatedly, and then assigned initial codes such as “electricity constraints”, “unstable signal”, “unsustained training”, “PMM as an opportunity”, “digital administrative burden”, and “offline strategy”. These codes were grouped into broader themes reflecting infrastructure, competency, policy support, and teachers' adaptive strategies. Data trustworthiness was maintained through source triangulation between teachers and administrative staff, technique triangulation among interviews, observations, and documentation, member checking with selected informants, and peer debriefing to review the consistency of interpretations. These procedures were used to ensure that the findings were not merely descriptive but also credible and dependable as qualitative research outcomes.

RESULTS AND DISCUSSION

Results

Based on interviews, observations, and a review of school documents, teachers at SMPN 6 Satu Atap Bahorok viewed digital transformation as an unavoidable necessity in the educational process. The teachers stated that technology has the potential to open wider learning access for students in rural areas. They regarded digital devices, learning platforms, and online learning resources as means of enriching teaching materials and connecting students with information that was previously difficult to reach. Nevertheless, this positive acceptance of technology has not been fully accompanied by the school's operational readiness. Field data show that teachers have the willingness to change, but these efforts are often constrained by limitations in the basic facilities required for digital learning.

An interview with one teacher revealed strong enthusiasm as well as frustration with the school's condition. The teacher stated, “We really want to move forward. Technology is a window for village children so that they do not fall behind children in the city. But how can it work if laptops often break down, the signal weakens when it rains, and electricity frequently goes out? It feels like wanting to run, but our feet are tied.” This statement illustrates teachers' daily experience: they have accepted the importance of digitalization but do not yet have a stable working environment to implement it. Teachers do not reject change; rather, they feel that change is difficult to realize when supporting facilities are not adequately available.



Field observations indicated that the internet network within the school environment was not consistently stable. At certain times, teachers could access learning materials online, while at other times access became very slow or unavailable. Network disruption was felt more frequently during bad weather, especially when it rained. This condition prevented teachers from fully relying on internet-based learning directly in the classroom. Several teachers stated that they had to prepare materials before lessons began by downloading teaching resources from areas with stronger signals. Thus, the use of technology at the school was uneven and highly dependent on daily technical conditions.

In addition to internet connectivity, electricity supply was also a major obstacle to the use of technology. Teachers and administrative staff reported that unstable electricity could disrupt both learning activities and administrative work. School electronic devices were also vulnerable to damage when outages or sudden changes in electric current occurred. In several learning activities, teachers had to stop using projectors, laptops, or other digital devices because the electricity went out. This condition made digital learning impossible to design fully as the main instructional method. Teachers eventually prepared manual alternatives so that learning could continue even when technological devices could not be used.

School documentation showed that the availability of information and communication technology devices remained limited compared with instructional and administrative needs. Available devices were used alternately by teachers, so not all teachers could use digital equipment at the same time. Several teachers also used personal devices to prepare teaching materials, access platforms, or complete administrative tasks. The use of personal devices helped the work process run more smoothly, but it also added to teachers' burdens, especially when private devices had to be used for school purposes. This situation indicates that the school's digital readiness has not been fully supported by adequate institutional facilities.

In terms of competency, teachers demonstrated a relatively high willingness to learn. Some teachers used the Merdeka Mengajar Platform to find examples of teaching modules, watch training materials, and understand new learning practices. Teachers who were more accustomed to using technology helped other teachers access documents, download materials, or understand certain features of digital platforms. This mutual assistance emerged informally and became part of the school's work culture. However, teachers also stated that the training they had received was not continuous and was not always aligned with the school's conditions of limited internet access, electricity, and devices.



Teachers viewed the Merdeka Mengajar Platform in varied ways. Some teachers considered the platform useful because it provided learning inspiration and administrative examples that could be studied independently. However, some teachers also felt pressure when required to upload concrete actions, complete training, or synchronize data amid network limitations. They explained that digital tasks often required additional time outside teaching hours, especially when uploads failed or had to be repeated. Under these conditions, the digital platform was understood as both an opportunity and a new workload for teachers in rural schools.

School administrative staff also experienced the direct impact of limited digital infrastructure. One administrative staff member stated, "We were synchronizing Dapodik data when the electricity suddenly went out. The data that had been entered disappeared and had to be repeated from the beginning. It was very exhausting and made us anxious every time we had to upload important data." This experience shows that the digitalization of school administration not only demands technical skills but also increases work pressure when supporting facilities are unstable. Reporting and data synchronization activities became tasks requiring caution, longer time, and readiness to face the risk of repeated work.

To deal with these limitations, teachers developed several adaptive strategies. They downloaded materials when they were in areas with stronger signals, stored teaching resources offline, used lightweight learning media, and combined direct explanations with digital materials prepared in advance. Teachers also shared information with one another about the best times to access the internet and how to complete digital tasks while saving data quota. These strategies show that teachers continued to strive to maintain the quality of learning despite limited facilities. However, the teachers emphasized that personal strategies and informal collaboration were insufficient if not accompanied by policy support, devices, electricity, and more stable networks.

Discussion

The finding that teachers showed high acceptance of digital transformation while the school's operational readiness remained low demonstrates that digital readiness cannot be reduced to teachers' individual attitudes alone. Within the framework of educational transformation, Mhlanga (2024) emphasizes that technology integration requires systemic readiness, including infrastructure, devices, and user capacity. Field data from SMPN 6 Satu Atap Bahorok show that teachers already have a positive orientation toward technology, but the school system has not yet provided adequate operational prerequisites. Thus, the phenomenon of "mentally ready but facility



constrained” expands the understanding of school readiness as a construct that brings together psychological, technical, institutional, and geographical aspects.

The network, electricity, and device limitations found in this study are directly connected to studies on the digital divide in rural schools. Azionya and Nhedzi (2021) show that the digital divide concerns not only internet access but also schools' ability to use technology consistently in the learning process. The findings in Bahorok reveal a concrete form of this divide: teachers can understand the benefits of digital platforms, but they cannot always use them because basic infrastructure is not consistently available. In this context, educational digitalization risks widening inequality if national policy is not accompanied by affirmative interventions for schools located far from service centers.

The findings regarding teachers' self-directed learning and mutual assistance can be read through the Technological Pedagogical Content Knowledge framework. Mishra and Koehler (2006) explain that effective technology integration requires the combination of technological, pedagogical, and content knowledge. However, Rosenberg and Koehler (2015) emphasize that the implementation of TPACK cannot be separated from the context in which teachers work. The data in this study show that teachers are gradually developing TPACK through daily experience, but this development is constrained by signal conditions, electricity, devices, and unsustained training. Therefore, strengthening rural teachers' competencies must be designed contextually, not merely as standardized application training.

Teachers' ambivalence toward the Merdeka Mengajar Platform shows that educational technology has two sides: it opens access while also increasing administrative burdens. McKnight et al. (2016) state that technology can improve learning practices when it is used to strengthen pedagogy rather than merely fulfill procedural demands. The findings of this study show that teachers use PMM as a source of inspiration, but they also experience pressure when upload, synchronization, and reporting features do not match the school's connectivity conditions. Therefore, educational platforms for rural schools need to be designed according to the principle of digital inclusion, such as offline modes, gradual synchronization, lightweight materials, and guidance that is easy for teachers with limited access to follow.

Teachers' adaptive strategies through downloading materials, storing resources offline, using personal devices, and informal collaboration demonstrate professional resilience. This finding is consistent with Rogers (1969), who positions teachers as active subjects who learn through experience, relationships, and problem solving. From a psychological perspective, Putra, Simaremare, and Dina (2024) show that emotional regulation is related to teachers' work motivation. At SMPN 6 Satu Atap Bahorok,



emotional regulation appeared when teachers continued to maintain the learning process despite network and electricity failures. However, teachers' resilience should not be used as a reason to normalize structural deficiencies; institutional support remains necessary so that the burden of adaptation is not borne entirely by individual teachers.

The role of school leadership and policy support is a crucial link between field findings and the strengthening of digital transformation. Sariani and Bakti (2026) emphasize the importance of transformational leadership, motivation, and commitment in improving organizational performance. In the rural school context, transformational leadership needs to be translated into concrete actions, such as mapping digital needs, strengthening teacher learning communities, providing flexibility in administrative targets, advocating to local governments, and building partnerships with technology service providers. Thus, digital transformation at SMPN 6 Satu Atap Bahorok cannot be pursued merely by encouraging platform use; it requires a policy ecosystem that ensures infrastructure, competency, and mentoring are developed equitably.

CONCLUSION

This study concludes that school readiness for digital transformation at SMPN 6 Satu Atap Bahorok is marked by a gap between teachers' high mental readiness and the school's low operational readiness. Teachers have positive perceptions of technology and view digitalization as an opportunity for rural students to gain broader learning access. However, these positive perceptions have not been fully realized due to limitations in internet connectivity, electricity supply, devices, training, and technical support. The most important finding of this study is the phenomenon of "mentally ready but facility constrained". This phenomenon indicates that digital transformation problems in rural schools cannot be simplified as low teacher digital literacy. Instead, teachers demonstrate resilience, emotional regulation, and creativity through digital local wisdom strategies, such as offline-first methods, selective use of PMM, peer mentoring, and data-saving media. Therefore, educational digitalization policies need to be more sensitive to local contexts and should not merely emphasize platform-based administrative achievement.

This study recommends five main actions. First, local governments need to strengthen basic infrastructure by providing backup electricity, school internet access, and device maintenance. Second, national education platforms need to provide offline synchronization features and lightweight content. Third, schools need to build sustainable teacher learning communities oriented toward contextual TPACK. Fourth, partnerships with local governments, internet service providers, universities, and the private sector should be expanded to support digital equity. Fifth, digital content must continue to include local, multicultural, and character values so that digital



transformation does not detach students from their sociocultural identity. The limitation of this study lies in its single-case focus; therefore, future research may use comparative designs across rural schools to strengthen analytical generalization.

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