



Digital Transformation and The Dynamics of School Culture In Indonesian Madrasah Ibtidaiyah

Ali Imron

Universitas Islam Tribakti Lirboyo Kediri
imron@uit-lirboyo.ac.id

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Abstrak

Era digital membawa perubahan signifikan dalam pendidikan, termasuk di madrasah ibtidaiyah, yang menuntut guru meningkatkan kompetensi teknologi, inovasi pembelajaran, dan penguatan karakter Islami peserta didik. Transformasi digital menghadirkan tantangan dalam penyediaan layanan pendidikan yang optimal, khususnya terkait integrasi teknologi dalam proses pembelajaran. Penelitian ini bertujuan mengidentifikasi tantangan yang dihadapi guru madrasah ibtidaiyah di era digital melalui metode deskriptif kualitatif dengan studi pustaka. Hasil penelitian menunjukkan bahwa tantangan utama meliputi keterbatasan infrastruktur dan fasilitas, minimnya pelatihan profesional berkelanjutan, rendahnya minat literasi akademik siswa, serta belum optimalnya pemanfaatan media pembelajaran berbasis digital. Guru menghadapi tantangan yang bersifat multidimensional, mencakup aspek teknologis, profesional, dan budaya literasi. Oleh karena itu, peningkatan kualitas pendidikan di madrasah ibtidaiyah memerlukan upaya komprehensif melalui pelatihan adaptif dan penyediaan fasilitas yang memadai agar pembelajaran lebih efektif, relevan, serta tetap menjaga peran guru sebagai teladan dalam membimbing penggunaan teknologi secara bijak.

Keywords: Madrasah, Budaya Sekolah, Era Digital.

Abstract

The digital era has brought significant transformations to education, including in Madrasah Ibtidaiyah. Teachers are required to enhance their technological competence, instructional innovation, and the reinforcement of students' Islamic character. Digital transformation presents substantial challenges in delivering optimal educational services, particularly in integrating technology into the teaching and learning process. This study aims to identify the challenges faced by Madrasah Ibtidaiyah teachers in the digital era using a qualitative descriptive method through a literature review. The findings indicate that the primary challenges include limited infrastructure and facilities, insufficient continuous professional development, low student interest in academic literacy, and the underutilization of digital-based learning media. Teachers face multidimensional challenges encompassing technological, professional, and literacy-cultural aspects. Therefore, improving the quality of education in Madrasah Ibtidaiyah requires comprehensive efforts through adaptive training programs and adequate infrastructure provision to ensure that learning becomes more effective, engaging, and relevant to contemporary demands, while maintaining teachers' roles as moral exemplars who guide students in the responsible use of technology.

Keywords: Madrasah (Islamic School), School Culture, Digital Era



INTRODUCTION

The development of digital technology has brought significant changes to various aspects of human life. One of the sectors most profoundly affected is education. In this digital era, education has undergone transformation in multiple dimensions, ranging from teaching methods and infrastructure to patterns of interaction between teachers and students (S et al. 2025). The digital era represents a period in which technological advancement has reshaped how individuals access information and engage in learning. Madrasahs, as an integral part of the education system in Indonesia, are not exempt from these transformations.

Madrasah Ibtidaiyah, as Islamic primary educational institutions, have also experienced the impact of digital transformation (Mahsusi et al. 2024). These changes present various challenges that must be addressed by educators, particularly Madrasah Ibtidaiyah teachers, in order to provide optimal educational services to students . Performance management strategies for educational personnel in the era of digitalization must consider technological aspects, competencies, motivation, and organizational culture (Farikhatin et al., 2016). Educational staff in Islamic institutions are therefore required to possess adequate technological skills to harness the potential of digitalization in enhancing learning effectiveness.

Although the digital era offers numerous opportunities, it also presents considerable challenges. Rosmanda explains that current challenges include limited access to learning resources, insufficient technological skills, and curricula that remain overly traditional and less responsive to technological developments. Not all madrasahs have adequate infrastructure, such as stable internet access, availability of computers or tablets, and other supporting systems (Sitompul 2022). This condition becomes a barrier for teachers in integrating digital technology into the learning process. Furthermore, some teachers lack sufficient understanding of contemporary technologies, highlighting the need for targeted training to enable them to effectively utilize technology in teaching (Tisnelly et al. 2020).

The lack of training and mentoring for teachers also constitutes a major challenge in implementing digital technology in Madrasah Ibtidaiyah. Many teachers have not received adequate professional development related to educational technology. Therefore, continuous training programs are necessary to enhance teachers' competencies in digital technology. Such programs may include workshops, seminars, and online courses (via Zoom or Google Meet) focusing on the use of learning applications, the development of digital-based instructional materials, and effective teaching strategies in the digital era. Teachers must demonstrate flexibility in adapting to technological advancements and develop learning strategies aligned with students' needs. The use of technology should not merely replace traditional teaching methods, but should also improve the quality of learning to make it more engaging, effective, and relevant to contemporary developments (Gunawansyah and Mutmainah 2021).

Insufficient infrastructure remains a primary obstacle for madrasahs (Wulandani and Humaidi 2021). In light of these challenges, support from various stakeholders including the government, educational institutions, and the wider community is essential to enhance the quality of Madrasah Ibtidaiyah teachers in the digital era (Reksiana et al. 2024). The government plays a crucial role in providing adequate infrastructure and sustainable training programs. Educational institutions must also actively facilitate and support teachers in adopting digital technologies in their teaching practices. Through these collaborative efforts, Madrasah Ibtidaiyah teachers are expected to be better prepared to face digital-era challenges and deliver high-quality education for future generations (Liawati 2025).

Therefore, continuous professional development and capacity-building initiatives are necessary to enable teachers to effectively adapt digital-based teaching methods. This study aims to identify the primary challenges faced by Madrasah Ibtidaiyah teachers in the digital era and to formulate practical solutions to improve educational quality. With appropriate strategies and interventions, it is expected that the learning process in madrasahs will become more effective and responsive to contemporary demands.

METHOD

The method employed in this study is a descriptive qualitative approach using a literature review. Qualitative research is an approach that focuses on gaining an in depth understanding of social phenomena, meanings, subjective experiences, and participants' perspectives through the collection of non-numerical data such as texts, interviews, and observations (Moleong 2016).

A literature review is conducted by collecting data from various sources, both written and unpublished, including academic journals, books, and other relevant references that are aligned with the focus of the study. These sources are systematically analyzed in accordance with the main issues discussed by the author.

Library research or literature-based research is a data collection technique carried out through an extensive examination of books, scholarly literature, records, and various reports related to the problem under investigation. Through this data collection technique, the study aims to comprehensively identify and analyze the challenges as well as the strategies that can be implemented in addressing the digital era within the madrasah environment.

RESULTS AND DISCUSSION

Challenges in Building School Culture in the Era of Digitalization

1. Infrastructure and Facility Limitations

Educational infrastructure is a crucial determinant in the development of a nation's education system. It encompasses various physical and non-physical elements that support the teaching and learning process. Through the provision of high-quality educational infrastructure, accessible facilities, and relevant learning programs, individuals can acquire the knowledge and competencies necessary to enhance their well-being and productivity. Facilities, according to (Putri 2019), refer to the means and infrastructure that must be available to support educational activities in schools. Facilities include all equipment, materials, and furniture directly used in the educational process, such as school buildings, classrooms, learning media, desks, and chairs. Meanwhile, educational infrastructure refers to fundamental components that indirectly support the educational process, including school yards, gardens, and access roads to the school.

Madrasah Ibtidaiyah in various regions continue to face structural challenges in educational management, particularly related to limitations in infrastructure and learning support facilities. Numerous studies indicate that infrastructure issues remain one of the fundamental challenges in improving the quality of madrasah education, especially at the primary level. These limitations include the lack of technological learning devices, inadequate classrooms, insufficient numbers of learning spaces relative to student enrollment, and deteriorating building conditions due to aging structures and limited maintenance.

In the context of digital transformation in education, these infrastructural limitations become increasingly critical. The digital era demands the integration of technology into the learning process, whether through digital devices, internet access, or the utilization of online learning platforms. However, various studies reveal that the unequal distribution of technological resources among madrasahs has hindered the optimal implementation of digital-based learning. This gap not only affects the effectiveness of teaching and learning activities but also influences the capacity of madrasahs to build a school culture that is adaptive to technological change.

Furthermore, the literature emphasizes that inadequate physical school conditions may affect students' learning motivation and teachers' performance. An uncomfortable learning environment and limited supporting facilities can hinder pedagogical innovation and reduce opportunities for implementing interactive technology-based learning. Therefore, strengthening educational infrastructure is a fundamental prerequisite for supporting digital



transformation while fostering a school culture that is responsive, collaborative, and quality-oriented.

Beyond instructional considerations, the quality of school buildings and classroom feasibility significantly influence students' comfort. Some madrasahs still operate in aging buildings with poor lighting, inadequate ventilation, or damaged classroom furniture. Such conditions not only disrupt students' concentration but may also pose safety risks. In some cases, madrasahs are compelled to use temporary or emergency spaces because their main buildings are no longer suitable for use. Disparities in educational infrastructure reflect the unequal access to adequate education for children across Indonesia. Educational progress will remain an aspiration if physical facilities are not given serious attention. It is unrealistic to expect students to learn safely and comfortably if classrooms do not meet minimum standards, just as equitable education remains difficult to achieve when some regions still lack proper school buildings.

If infrastructural needs can be adequately addressed, madrasahs will have greater opportunities to enhance the quality of learning. Teachers can implement more creative teaching methods, while students can gain more meaningful learning experiences and adapt to technological advancements. Ultimately, improved facilities will contribute to elevating the quality of madrasah education, making it more competitive and relevant to contemporary demands.

The Lack of Sustainable Professional Development for Teachers

In addition to infrastructural and facility limitations, another critical issue is the lack of continuous professional training and development for teachers. Teachers serve as the primary agents in the educational process, and their quality plays a crucial role in improving student learning outcomes. Relevant and sustainable teacher training models are essential components in supporting the implementation of innovative learning practices. However, empirical realities indicate that many teachers have not received adequate training, both in innovative pedagogical approaches and in mastering information and communication technology (ICT) (Reksiana et al. 2024). The absence of intensive training has left many teachers unprepared to implement activity-based learning and 21st-century skill-oriented instruction (Zuhri and Wahyuni 2025).

Available training programs are often general in nature, lack contextual relevance, and are insufficiently aligned with actual classroom needs. As a result, teachers frequently encounter difficulties in integrating collaborative approaches and technology into their teaching practices.

In rural areas, teachers often receive limited preparation to cope with curriculum changes and contemporary learning challenges that require digital technology integration. This situation creates a gap between teachers and students. Today's students are born into the digital era and are accustomed to using technology in their daily lives, while teachers may lack access to innovative teaching methods or updated technological tools. The lack of adequate training makes it difficult for teachers to adapt, resulting in learning processes that become monotonous and less relevant to students' needs.

Moreover, the training provided is often short-term, unsustainable, and lacks follow-up in the form of mentoring or in-depth professional coaching. Limited access to adaptive training programs is also influenced by insufficient institutional support in terms of funding, time allocation, and formal recognition of teachers' professional development. The absence of systematic training prevents teachers from mastering innovative instructional strategies and emerging pedagogical models. Furthermore, inadequate training deprives teachers of the support necessary to address contemporary challenges, such as teaching students with special needs or managing classroom behavioral issues. Without relevant competencies, teachers may feel overwhelmed, which can ultimately affect the overall quality of education.

Several factors contribute to the lack of teacher training, including limited school budgets, demanding workloads, and insufficient initiative from relevant authorities. Existing training programs are often misaligned with teachers' practical needs in the field. In fact, professional training and development should be an integral component of the teaching profession. Such programs not only enhance instructional skills but also motivate teachers to continuously learn and innovate. When teachers feel valued and supported by the system, their job satisfaction increases, which in turn positively impacts educational quality.

Students' Low Interest in Academic Literacy

Literacy refers to the skills of reading, writing, understanding texts, and numeracy, which constitute a fundamental foundation for students' future learning (Triani et al. 2024). A decline in students' interest in academic literacy characterized by decreasing abilities in reading, writing, and text comprehension has a significant impact on their academic achievement. Low literacy skills hinder students' access to knowledge and information, thereby affecting their ability to learn effectively. Literacy is defined as the ability to understand, use, reflect on, and engage with various types of texts in order to achieve specific goals. Mastery of literacy thus becomes a key indicator in improving students' academic performance.

The implementation of literacy practices at the primary education level helps shape students into intelligent, creative (Rasidi and Susetiyo 2023), and competitive individuals. Children who actively engage in literacy activities are more likely to direct themselves toward



positive development. Those who read frequently tend to demonstrate stronger cognitive abilities and intellectual advantages compared to those who show little interest in reading. Nevertheless, the literacy levels of students in schools remain concerning. This condition is influenced by limited facilities, such as outdated reading materials, inadequate library spaces, and less innovative literacy approaches (Yüksel et al. 2023). Low literacy levels are often associated with environmental factors that do not adequately support literacy movements. In this regard, a supportive environment, adequate facilities, and strong commitment from all school stakeholders are essential (Ababil et al. 2024).

The rapid development of information and communication technology in the digital era has brought fundamental changes to various aspects of life, including education. Digital transformation influences how students access information, interact, and learn (Wu and Zhang 2025). Digital media such as interactive videos, online games, social media platforms, and online learning applications are often more appealing to students than traditional print media such as textbooks or educational magazines (Nasution et al. 2025). This shift presents a serious challenge, as literacy remains an essential foundational competence for children's cognitive, social, and emotional development.

The impact of the literacy crisis is far-reaching. It can hinder academic achievement, reduce critical thinking skills, increase vulnerability to misinformation, limit educational and career opportunities, and negatively affect social and economic development. A generation with low literacy skills will struggle to participate effectively in a knowledge- and technology-based society. A lack of reading interest may also lead to difficulties in understanding science and technology, limited insight and positive thinking patterns, underdeveloped creativity, reduced self-improvement capacity, social disengagement, and ultimately national disadvantages due to the loss of high-quality human resources. Therefore, schools as formal educational institutions play a strategic role in fostering a literacy culture that is adaptive to technological developments, while simultaneously shaping a generation that is critical, creative, and capable of utilizing information effectively.

Teachers in the Contemporary Era Must Possess Digital Skills

Education in the digital era is not merely about the use of technological devices, but about how technology is meaningfully utilized to enhance the quality of learning processes and outcomes. Therefore, the role of teachers becomes crucial in guiding the use of technology so that it does not merely function as entertainment, but rather as a medium for character building and the development of 21st-century competencies. In this context, teachers in Indonesia need to understand that digital transformation in education is part of broader efforts to achieve sustainable development goals, which emphasize inclusive and quality education, as well as the utilization of technological innovation to support societal advancement.

The role of teachers in the digital era extends beyond technological adaptation; it involves a comprehensive shift in educational paradigms. Under the Merdeka Curriculum, teachers are granted greater autonomy to design student-centered learning, emphasizing the “4C” competencies (critical thinking, creativity, collaboration, and communication). In this approach, teachers are not merely content deliverers but facilitators who assist students in constructing knowledge through experience and reflection rather than simply transferring information.

Teachers constitute a fundamental component of education and are recognized as professional educators. They are responsible for guiding, educating, directing, training, assessing, and evaluating students. Professional teachers are characterized by competencies in pedagogy, personality, social interaction, and professional expertise (Mahsusi et al. 2024). However, in the current digital context, these competencies require adaptation so that teachers are able to anticipate and prepare for students’ learning needs in the digital age.

In the 21st century, often referred to as the digital era, teachers are increasingly expected to be active, critical, innovative, creative, and collaborative in responding to technological advancements in order to keep pace with contemporary teaching trends (Akrim 2022). The teacher’s role is no longer limited to instruction but also encompasses facilitation, enabling students to utilize diverse learning resources, including digital technologies as instructional media. Therefore, teachers’ technological competencies must remain updated and, ideally, exceed those of their students (Sharma et al. 2021), since the integration of technology in teaching significantly contributes to high-quality learning.

Teachers in today’s digital era are required to master and effectively utilize technology in designing innovative and creative learning experiences. The students they teach belong to a generation raised amidst rapid technological development and are therefore highly familiar with digital tools. This reality underscores the obligation of teachers, as central actors in education, to continuously upgrade their competencies to remain responsive to educational technological advancements. Furthermore, teachers are no longer solely information providers; they must function as facilitators and motivators who encourage students to explore their learning potential independently by seeking and processing information autonomously.

One of the primary challenges in this regard is the digital literacy gap among educators. According to data from the Ministry of Education and Culture, a significant proportion of teachers in Indonesia still demonstrate insufficient digital competence. In rural areas in particular, many teachers have not been able to optimize the use of educational technology in the learning process. This limitation is evident in the predominantly basic use of technology, such as PowerPoint presentations or WhatsApp Groups for content delivery. Meanwhile, Learning Management System (LMS)-based platforms such as Google Classroom, Moodle, and Merdeka Mengajar have not been fully utilized as interactive and



systematic learning tools. Therefore, teachers need to strengthen their capacity in utilizing information technology to broaden their knowledge and develop creative and varied instructional methods, thereby increasing students' interest and engagement in learning.

Limited Use of Digital-Based Learning Media

Learning media refer to any tools, including both software and hardware, used to convey instructional messages learning materials in ways that stimulate students' attention, interest, thoughts, and emotions during the learning process in order to achieve educational objectives. Learning media constitute an integral component of the instructional system, meaning that they cannot be separated from the teaching and learning process. Without learning media, effective instructional interaction cannot occur. Every teaching and learning activity requires the selection and use of at least one medium to facilitate content delivery. Learning media function as channels for transmitting information to learners so that the message can be accurately received and the learning process can proceed effectively (Fasinro et al. 2024).

The characteristics of instructional media include: (1) Fixative, referring to media that can capture, record, store, and reconstruct objects or events; (2) Manipulative, referring to media that can modify recorded events or objects through editing, thereby making the presentation more efficient; and (3) Distributive, referring to media that allow objects or events to be transmitted across space and presented to students in ways that create similar learning experiences.

In the past, teachers were considered the sole source of knowledge in the classroom, and educational practices were predominantly traditional and teacher-centered. One of the main challenges related to the use of digital-based learning media is teachers' limited competence in utilizing such media effectively. Teachers must develop their digital technological skills to adequately plan, implement, and reflect on the integration of digital technology in instruction.

The development and use of digital learning media remain relatively limited. In practice, many teachers utilize only a small portion of available digital media types in their instruction. The most commonly used digital medium tends to be instructional videos, while other forms of digital media are rarely employed. In fact, digital media encompass a wide range of tools that can be adapted to different instructional objectives. In the context of digital learning media, utilization appears to be more dominant than innovation or development, indicating that teachers often rely on existing materials rather than creating or modifying media to better suit their pedagogical needs.

The success of digital learning depends largely on teachers' ability to implement appropriate instructional strategies that foster effective learning environments. Limited technological competence among teachers is often influenced by a lack of motivation to move beyond previous instructional systems. Additionally, age may also be a contributing factor, as teachers over the age of 40 may have had limited exposure to advanced technology during their formative training years. Consequently, ongoing professional development and adaptive learning are necessary to ensure that teachers remain capable of integrating digital media effectively into contemporary educational practices.

CONCLUSION

The findings indicate that educational transformation has not yet been fully optimized, particularly in madrasahs and schools in regional areas. Major challenges include limited infrastructure and facilities, inadequate sustainable professional development for teachers, low student interest in academic literacy, increasing demands for teachers' digital competencies, and the limited use of digital-based learning media.

Infrastructure constraints remain a fundamental barrier, as inadequate physical conditions and limited technological resources hinder effective digital learning implementation. At the same time, teachers face challenges in adapting to 21st-century learning demands due to insufficient, non-sustainable, and less contextual professional training, particularly in innovative pedagogy and digital technology. The digital literacy gap among teachers especially in rural areas further complicates efforts to integrate technology meaningfully into the learning process.

Students' declining interest in academic literacy, amid the dominance of more attractive digital media, also poses serious risks to the development of critical thinking, academic achievement, and long-term competitiveness. Additionally, the limited and less varied use of digital learning media often results in monotonous instructional practices that reduce student engagement.

Overall, strengthening school culture in the digital era requires a comprehensive and collaborative approach, including adequate infrastructure provision, continuous teacher professional development, reinforcement of students' literacy culture, and the optimal and creative integration of digital technology in learning. With strong policy support, institutional commitment, and improved human resource capacity, schools and madrasahs can create adaptive, high-quality learning environments that are responsive to contemporary challenges and capable of nurturing critical, creative, and competitive future generations.

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