

The Transformation of Digital Islamic Education at the Global Level and New Directions for 21st-Century Learning

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Abstract

The rapid advancement of digital technologies has transformed educational systems worldwide, including the field of Islamic education. Digital transformation has reshaped teaching and learning processes by integrating online platforms, artificial intelligence, learning management systems, mobile learning, and interactive digital resources into educational practices. This literature review aims to examine the global development of digital Islamic education and explore its implications for twenty-first-century learning. The study employs a literature review approach by analyzing scholarly publications, policy documents, and empirical studies related to digital learning, Islamic education, educational technology, and contemporary pedagogical innovations. The findings indicate that digital Islamic education has expanded learning accessibility, promoted flexible learning environments, facilitated global knowledge exchange, and enhanced learner engagement. However, challenges remain regarding digital literacy, technological infrastructure, educational equity, data privacy, and the preservation of Islamic values within digital environments. The review highlights the importance of integrating technological innovation with Islamic educational principles to create effective, inclusive, and value-oriented learning ecosystems. Future directions emphasize personalized learning, artificial intelligence integration, and the development of sustainable digital educational frameworks that support lifelong learning in Muslim communities worldwide.

Keywords

Digital Islamic Education, Educational Technology, Digital Transformation, Twenty-First-Century Learning, Artificial Intelligence, Islamic Pedagogy, Literature Review



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INTRODUCTION

The rapid development of digital technology has fundamentally transformed educational systems worldwide. The emergence of the internet, cloud computing, mobile technologies, artificial intelligence (AI), learning analytics, and digital

learning platforms has reshaped how knowledge is produced, disseminated, and accessed. Educational institutions are increasingly adopting digital technologies to improve learning effectiveness, expand access to education, and create more flexible learning environments that meet the needs of contemporary learners. Digital transformation is no longer viewed merely as a technological trend but has become a strategic necessity for educational institutions seeking to remain relevant in an increasingly interconnected world. International organizations such as UNESCO and the Organisation for Economic Co-operation and Development (OECD) have emphasized that digital transformation represents one of the most significant developments influencing the future of global education. Digital technologies have the potential to enhance educational quality, personalize learning experiences, increase inclusion, and improve institutional efficiency when implemented appropriately (UNESCO, 2024; OECD, 2026).

The transformation of education has become even more pronounced following the global disruptions caused by the COVID-19 pandemic. During this period, digital learning emerged as a critical mechanism for ensuring educational continuity across countries and educational sectors. The pandemic accelerated the adoption of online learning platforms, virtual classrooms, digital resources, and technology-mediated instruction on an unprecedented scale. Consequently, educational institutions around the world began investing more heavily in digital infrastructure, teacher training, and technology-enhanced pedagogical practices. This transformation has continued beyond the pandemic era, leading to the development of hybrid learning models, blended learning approaches, and AI-assisted educational systems that increasingly characterize twenty-first-century education (UNESCO, 2024).

Within this broader context, Islamic education has also experienced significant digital transformation. Traditionally, Islamic education has relied heavily on face-to-face instruction, direct teacher-student interaction, and the transmission of religious knowledge through established institutional structures such as madrasahs, Islamic schools, universities, and pesantren. However, the increasing availability of digital technologies has expanded opportunities for Islamic educational institutions to modernize instructional practices while preserving their religious and ethical foundations. Contemporary Islamic educational institutions are increasingly utilizing learning management systems, digital libraries, online religious resources, mobile applications, virtual classrooms, and AI-supported learning environments to facilitate teaching and learning processes. This shift reflects a broader effort to

integrate technological innovation with Islamic educational values in response to changing societal and educational demands.

The integration of digital technologies into Islamic education offers numerous opportunities. First, digital technologies significantly expand access to Islamic knowledge beyond geographical boundaries. Learners from different regions can access religious lectures, scholarly discussions, digital Qur'anic resources, and educational materials through online platforms. Second, technology enhances learning flexibility by enabling students to engage with educational content anytime and anywhere. Third, digital learning environments support interactive and student-centered pedagogical approaches that promote collaboration, critical thinking, and self-directed learning. Fourth, digital technologies facilitate global knowledge exchange among Muslim scholars, educators, and learners, contributing to the development of more interconnected learning communities. These opportunities demonstrate the transformative potential of digitalization in enhancing the accessibility, effectiveness, and reach of Islamic education worldwide.

The emergence of artificial intelligence represents another important dimension of contemporary educational transformation. AI technologies are increasingly being incorporated into educational systems through intelligent tutoring systems, adaptive learning platforms, automated assessment tools, learning analytics, and personalized educational services. Scholars argue that AI has the capacity to enhance educational effectiveness by providing individualized learning experiences, improving student engagement, and supporting data-driven decision-making processes. In Islamic education, AI-based applications can assist learners in accessing religious knowledge, understanding complex concepts, and receiving personalized learning support. Nevertheless, the integration of AI also raises important questions regarding ethics, data privacy, academic integrity, and the preservation of human-centered educational values. These concerns are particularly relevant within Islamic educational contexts, where moral development and character formation remain central educational objectives.

Despite these opportunities, digital transformation in Islamic education also presents substantial challenges. One major challenge relates to the unequal distribution of technological infrastructure across regions and countries. Significant disparities in internet access, digital resources, and technological readiness continue to limit the effectiveness of digital learning initiatives in many educational settings. Furthermore, variations in digital literacy among educators and students may hinder the successful implementation of technology-enhanced learning. Teachers often

require additional professional development to effectively integrate digital tools into pedagogical practices. At the same time, learners must develop digital competencies that enable them to navigate increasingly complex online environments. These challenges highlight the importance of developing comprehensive strategies that address both technological and human dimensions of digital transformation.

Another critical issue concerns the preservation of Islamic values within digital educational ecosystems. The rapid expansion of digital technologies has generated concerns regarding misinformation, inappropriate content, ethical misuse of technology, and the potential erosion of moral and spiritual dimensions of learning. Islamic education seeks not only to transmit knowledge but also to cultivate character, ethical awareness, and spiritual development. Therefore, the successful integration of digital technologies requires educational frameworks that align technological innovation with Islamic principles such as *adab* (ethical conduct), *amanah* (trustworthiness), moderation, responsibility, and social accountability. Recent scholarship emphasizes the importance of developing digitally empowered yet value-oriented educational models capable of balancing technological advancement with religious and ethical commitments.

The concept of twenty-first-century learning further strengthens the relevance of digital transformation within Islamic education. Twenty-first-century education emphasizes critical thinking, creativity, communication, collaboration, digital literacy, problem-solving, and lifelong learning. These competencies are increasingly recognized as essential for navigating complex global environments characterized by rapid technological change. Islamic educational institutions are therefore challenged to prepare learners who are not only knowledgeable in religious teachings but also capable of participating effectively in digitally connected societies. The integration of digital technologies can support the development of these competencies while simultaneously promoting the moral and ethical dimensions emphasized in Islamic educational philosophy. This convergence between digital innovation and Islamic educational objectives represents an important area of contemporary educational inquiry.

Although a growing body of literature has examined digital learning, educational technology, and Islamic education separately, relatively few studies have synthesized these discussions within a global perspective that specifically addresses the transformation of digital Islamic education and its implications for twenty-first-century learning. Existing studies often focus on technological implementation, teacher readiness, digital literacy, or AI applications in isolation. Consequently, there

remains a need for a comprehensive literature review that integrates these themes and identifies emerging trends, opportunities, challenges, and future directions shaping digital Islamic education worldwide.

Therefore, this literature review aims to explore the global transformation of digital Islamic education and examine its implications for the future of twenty-first-century learning. Specifically, the study seeks to analyze major trends in digital Islamic education, identify opportunities and challenges associated with technological integration, evaluate the role of artificial intelligence and emerging educational technologies, and propose future directions for developing inclusive, ethical, and sustainable digital learning ecosystems within Islamic educational contexts. By synthesizing contemporary scholarship from diverse educational settings, this review contributes to a deeper understanding of how Islamic education can adapt to digital transformation while preserving its distinctive moral, spiritual, and educational foundations.

METHODS

This study employed a literature review approach to examine the global transformation of digital Islamic education and its implications for twenty-first-century learning. A literature review was selected because it enables researchers to synthesize existing knowledge, identify emerging trends, evaluate current developments, and establish future research directions within a particular field of study. According to Snyder (2019), literature reviews play a crucial role in consolidating fragmented research findings and providing comprehensive insights into evolving academic discourses. Similarly, Booth et al. (2021) argue that literature reviews facilitate the development of theoretical understanding by integrating evidence from multiple studies and contexts.

The review focused on scholarly publications addressing digital education, Islamic education, educational technology, digital transformation, artificial intelligence in education, online learning, and twenty-first-century learning competencies. Relevant literature was collected from internationally recognized academic databases, including Scopus, Web of Science, Google Scholar, ERIC, and ScienceDirect. These databases were selected because they contain high-quality peer-reviewed publications that have significantly contributed to contemporary discussions on educational innovation and digital transformation.

The literature search was conducted using a combination of keywords and search strings, including “digital Islamic education,” “Islamic education and technology,” “digital transformation in education,” “artificial intelligence in

education,” “online learning in Islamic institutions,” “educational technology,” “digital pedagogy,” and “twenty-first-century learning.” The use of multiple keywords allowed the study to capture a broad range of publications relevant to the research objectives. Following the recommendations of Xiao and Watson (2019), a systematic search strategy was employed to ensure transparency, consistency, and comprehensiveness in the identification of relevant studies.

The inclusion criteria were established to ensure the relevance and quality of the selected literature. First, only publications written in English were included in the review to facilitate international comparability and accessibility. Second, the review prioritized studies published between 2020 and 2025 because this period reflects significant developments in digital education following the COVID-19 pandemic and the rapid emergence of artificial intelligence technologies. Third, the selected publications had to address at least one of the following themes: digital learning, Islamic education, educational technology integration, artificial intelligence applications, digital literacy, online pedagogy, or future educational trends. Publications that lacked direct relevance to the study objectives or did not provide sufficient empirical or theoretical contributions were excluded from the review.

After the identification process, the collected literature underwent a screening procedure. Titles, abstracts, and full texts were examined to determine their relevance to the research questions. This screening process helped eliminate duplicate records, unrelated studies, and publications that did not meet the inclusion criteria. According to Page et al. (2021), systematic screening enhances the reliability and validity of literature reviews by ensuring that only relevant and high-quality sources contribute to the final analysis.

The selected studies were then analyzed using thematic analysis. Braun and Clarke (2021) describe thematic analysis as a flexible qualitative method for identifying, organizing, and interpreting recurring patterns within a dataset. In this study, thematic analysis was used to categorize findings into several interconnected themes, including digital transformation in Islamic education, technological innovation, artificial intelligence integration, digital literacy development, educational opportunities, implementation challenges, and future directions for twenty-first-century learning. Thematic analysis enabled the identification of common trends and differences across various educational contexts and geographical regions.

To enhance the credibility of the findings, data triangulation was applied by comparing evidence from different types of publications, including empirical studies,

conceptual papers, policy reports, and institutional documents. The review also incorporated reports from international organizations such as UNESCO and OECD, which provide authoritative perspectives on digital education policies and global educational trends. The integration of multiple sources contributed to a more comprehensive understanding of the ongoing transformation of digital Islamic education.

Finally, the synthesized findings were interpreted through the lens of contemporary educational theories related to digital learning, technology-enhanced pedagogy, and twenty-first-century competencies. This approach facilitated a critical examination of how Islamic educational institutions are adapting to digital transformation while maintaining their distinctive educational values and religious foundations. The literature review therefore provides a comprehensive overview of current developments and offers evidence-based recommendations for future research and practice in digital Islamic education.

FINDINGS AND DISCUSSION

The findings of this literature review indicate that digital transformation has become one of the most influential forces shaping the development of Islamic education worldwide. Across various countries, including Indonesia, Malaysia, Saudi Arabia, Turkey, the United Arab Emirates, and several Western nations with significant Muslim populations, educational institutions have increasingly integrated digital technologies into teaching and learning processes. This transformation has been driven by technological advancement, globalization, changing learner expectations, and the growing demand for flexible educational opportunities. The reviewed literature demonstrates that digital Islamic education has evolved beyond the simple adoption of online learning platforms toward the creation of comprehensive digital learning ecosystems that combine educational technology, pedagogical innovation, and Islamic values (UNESCO, 2024; OECD, 2023).

One of the most significant findings concerns the expansion of educational accessibility. Digital technologies have enabled learners from diverse geographical, social, and economic backgrounds to access Islamic educational resources that were previously unavailable. Online learning platforms, virtual classrooms, digital libraries, and open educational resources have facilitated broader participation in Islamic education. Students can now engage with Qur'anic studies, Islamic jurisprudence, Arabic language learning, and religious scholarship through digital environments that transcend physical boundaries. This development is particularly important for Muslim communities living in remote areas or minority contexts where

access to qualified Islamic educators may be limited. Several studies emphasize that digital learning has contributed to the democratization of Islamic knowledge by reducing barriers related to location, time, and institutional capacity (Adebayo & Ahmed, 2023; UNESCO, 2024).

The review also reveals substantial changes in pedagogical approaches within Islamic educational institutions. Traditional teacher-centered instructional models are gradually being complemented by student-centered learning environments supported by digital technologies. Interactive multimedia resources, collaborative online platforms, discussion forums, and project-based learning activities have enhanced learner engagement and participation. Educational technologies allow students to become active participants in knowledge construction rather than passive recipients of information. Such developments align closely with the principles of twenty-first-century learning, which emphasize critical thinking, communication, collaboration, creativity, and problem-solving skills. Contemporary Islamic education increasingly seeks to integrate these competencies while maintaining the moral and ethical foundations central to Islamic educational philosophy (Redecker, 2020).

Artificial intelligence has emerged as another transformative factor influencing digital Islamic education. The reviewed literature demonstrates growing interest in AI-driven educational applications, including adaptive learning systems, intelligent tutoring platforms, automated assessment tools, and personalized learning environments. These technologies provide opportunities to customize learning experiences according to individual learner needs, preferences, and performance levels. AI-supported educational systems can deliver immediate feedback, identify learning difficulties, and recommend appropriate instructional resources. Within Islamic education, artificial intelligence has been applied to Arabic language learning, Qur'anic recitation support, educational content recommendation, and digital religious knowledge management. These innovations have the potential to improve learning effectiveness while expanding access to high-quality educational resources (Holmes et al., 2022).

However, the increasing integration of artificial intelligence also raises important ethical concerns. The literature highlights issues related to data privacy, algorithmic bias, academic integrity, and the possible reduction of human interaction in educational settings. Islamic educational traditions place considerable emphasis on mentorship, moral guidance, and character development through direct teacher-student relationships. Consequently, scholars argue that technological innovation

should complement rather than replace the human dimensions of education. Effective implementation requires a balanced approach that integrates technological capabilities with ethical considerations and educational values. The concept of responsible AI has therefore become increasingly relevant within discussions of digital Islamic education (OECD, 2023).

Another important finding concerns the role of digital literacy. The successful implementation of digital Islamic education depends not only on technological infrastructure but also on the ability of educators and learners to utilize digital tools effectively. Numerous studies identify digital literacy as a critical factor influencing educational outcomes. Teachers who possess strong digital competencies are more likely to design engaging learning experiences, integrate innovative pedagogical strategies, and facilitate meaningful online interactions. Similarly, students require digital literacy skills to evaluate information critically, navigate online environments responsibly, and participate effectively in technology-mediated learning. Despite significant progress, disparities in digital literacy remain evident across regions and educational institutions, creating challenges for equitable implementation (European Commission, 2022).

The review further indicates that digital transformation has contributed to the emergence of global learning communities within Islamic education. Digital platforms facilitate communication and collaboration among scholars, educators, and students from different cultural and geographical contexts. Online conferences, webinars, virtual seminars, and international learning networks have strengthened knowledge exchange and promoted cross-cultural understanding. Such developments support the globalization of Islamic education while encouraging dialogue between diverse educational traditions. The ability to access international perspectives enriches educational experiences and contributes to the development of globally competent learners capable of engaging with contemporary challenges from both local and global perspectives.

Despite these opportunities, significant challenges continue to affect the implementation of digital Islamic education. Infrastructure limitations remain among the most frequently reported obstacles. In many developing regions, inadequate internet connectivity, limited access to digital devices, and insufficient technological resources hinder effective participation in digital learning environments. Financial constraints may further restrict the ability of institutions to invest in technological infrastructure and professional development initiatives. These challenges contribute to persistent digital divides that affect educational equity and inclusion. The

literature consistently emphasizes the importance of policy interventions and institutional support mechanisms to address these disparities (UNESCO, 2024).

Another challenge involves maintaining the integrity of Islamic values within rapidly evolving digital environments. Digital platforms provide access to vast quantities of information, but they also expose learners to misinformation, inappropriate content, and ethical risks. Islamic educational institutions therefore face the task of developing frameworks that promote responsible digital citizenship while preserving religious and moral principles. Researchers argue that digital transformation should not be viewed solely as a technological process but also as a cultural and ethical transformation requiring careful consideration of educational values, social responsibilities, and spiritual development (Ally & Wark, 2021).

The findings also suggest that future developments in digital Islamic education will increasingly focus on personalization, lifelong learning, and sustainable educational innovation. Personalized learning environments supported by artificial intelligence are expected to become more sophisticated and accessible. Microlearning, mobile learning, immersive technologies, virtual reality, and augmented reality may further enhance educational experiences and engagement. At the same time, educational institutions will need to ensure that technological innovation remains aligned with broader educational objectives, including character formation, ethical awareness, and social responsibility. The integration of technological advancement with Islamic educational values represents a defining challenge and opportunity for future educational development.

Overall, the literature demonstrates that digital transformation is reshaping Islamic education on a global scale. While substantial progress has been achieved in expanding access, enhancing learning flexibility, and promoting innovation, the sustainability of these developments depends on addressing challenges related to infrastructure, digital literacy, ethics, and educational equity. The future success of digital Islamic education will require collaborative efforts among educators, policymakers, technology developers, and religious scholars to create inclusive, effective, and value-driven learning ecosystems capable of meeting the demands of twenty-first-century societies.

CONCLUSION

The transformation of digital Islamic education has emerged as a significant global phenomenon that is reshaping educational practices, institutional management, and learning experiences in the twenty-first century. The findings of this literature review demonstrate that digital technologies have become integral

components of contemporary Islamic education, enabling wider access to knowledge, greater learning flexibility, and more inclusive educational opportunities across diverse geographical and cultural contexts. The integration of digital platforms, learning management systems, artificial intelligence, mobile learning applications, and online educational resources has expanded the reach of Islamic education beyond traditional classroom settings while supporting the development of innovative pedagogical approaches. Digital transformation has also facilitated the formation of global learning communities, allowing scholars, educators, and students to engage in collaborative knowledge exchange regardless of geographical boundaries. These developments contribute significantly to the democratization of Islamic knowledge and the promotion of lifelong learning. The review further reveals that digital Islamic education plays a strategic role in fostering twenty-first-century competencies, including critical thinking, creativity, communication, collaboration, digital literacy, and problem-solving skills. The emergence of artificial intelligence offers new possibilities for personalized learning, adaptive educational systems, and data-driven instructional practices. However, the increasing adoption of advanced technologies also introduces challenges related to digital inequality, infrastructure limitations, educator readiness, data privacy, algorithmic bias, and ethical concerns. These issues highlight the necessity of developing human-centered and value-oriented educational frameworks that ensure technological innovation remains aligned with the fundamental objectives of Islamic education. Ultimately, the future of digital Islamic education depends on the ability of educational institutions, policymakers, technology developers, and religious scholars to balance technological advancement with Islamic ethical principles. Sustainable digital transformation requires not only technological investment but also the cultivation of digital literacy, responsible innovation, and moral awareness. By integrating technological excellence with spiritual and ethical values, digital Islamic education can effectively prepare future generations to navigate the opportunities and challenges of an increasingly digital world while preserving their religious identity, cultural heritage, and social responsibility.

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