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TECHNOLOGY AND AI INNOVATION: UTILIZING INFORMATION TECHNOLOGY AND AI FOR THE TRANSFORMATION OF ISLAMIC EDUCATION IN THE DIGITAL ERA

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ABSTRACT
This study examines the utilization of Information Technology and Artificial Intelligence (AI) in transforming Islamic education in the digital era through a literature review. It aims to analyze the application of information technology and AI, identify digital transformation in Islamic education, and explain the challenges and implementation strategies of AI. Using a qualitative descriptive approach, data were collected from national and international journals, books, proceedings, and official documents published between 2020 and 2026, and analyzed through thematic descriptive analysis. The findings indicate that information technology and AI enhance Islamic education through e-learning, Islamic smart classrooms, Learning Management Systems (LMS), AI-assisted Qur'anic learning, Arabic translation, virtual tutoring, and automated assessment, improving the effectiveness, flexibility, and quality of learning. Nevertheless, challenges remain, including limited digital literacy, inadequate infrastructure, unequal technology access, and ethical concerns. Therefore, the integration of AI in Islamic education should be implemented in a humanistic manner while upholding Islamic values, morality, and spirituality to foster innovative, adaptive, and character-oriented education.
Keyword *: Artificial Intelligence, Information Technology, Islamic Education, Educational Transformation, Digital Era.*

INTRODUCTION

The development of information and communication technology in the digital era has brought about major changes in various aspects of human life, including education. Digital transformation is driving a shift in learning systems from conventional models to technology-based learning that is more flexible, interactive, and adaptive. The presence of the internet, digital devices, cloud computing, and Artificial Intelligence (AI) has created a new paradigm in the modern education process. UNESCO affirms that AI has great potential to improve the quality of education through personalized learning, automation of academic administration, and increased access to education globally. (Nisfiya et al., 2026).

The development of Artificial Intelligence (AI) has become one of the most influential technological innovations in education in the Society 5.0 era. AI is a technology that enables computer systems to mimic human thinking through machine learning, data analysis, and automated decision-making. In education, AI is used to

support adaptive learning, virtual tutors, learning chatbots, and even student learning outcome analysis (Khoir, 2024; Winarno, 2024). The presence of AI technology not only increases the effectiveness of learning, but is also able to create a more personal and efficient learning experience (Thamrin et al., 2024).

In the context of Islamic education, developments in information technology and AI present both new opportunities and challenges. Islamic education, as an educational system based on the values of the Qur'an and Hadith, is required to adapt to technological developments to remain relevant to the needs of the digital generation. The transformation of Islamic education is not only related to the use of technological devices in learning but also encompasses the integration of spiritual, ethical, and moral values in the use of digital technology (Hakim et al., 2024; Saiful, 2023). Therefore, Islamic education needs to develop innovative learning models that are able to combine technological advances with Islamic values..

The use of information technology in Islamic education has evolved through various innovations, such as Islamic e-learning, digitalization of Islamic books, Islamic smart classrooms, virtual learning, and the use of digital-based Learning Management Systems (LMS). Furthermore, AI has begun to be used in Quranic learning, Arabic translation, automated learning evaluation, and the development of digital Islamic propagation media. These technologies facilitate access to knowledge, expand the reach of education, and improve the quality of learning interactions between teachers and students (Hakim et al., 2024). The use of AI can also help educators in compiling materials, making evaluations, and analyzing student learning progress more effectively (Jiang, 2023; Wu & Ma, 2023).

However, the implementation of information technology and AI in Islamic education still faces various challenges. Low digital literacy among educators, limited technological infrastructure, disparities in internet access, and ethical issues surrounding the use of AI are obstacles to the transformation of Islamic education in the digital era (Zamroni & Wakidi, 2023). In addition, excessive use of AI has the potential to cause technological dependency, a decline in critical thinking skills, and problems with the validity of Islamic sources in digital learning (Nguyen et al., 2023). Therefore, the use of technology and AI in Islamic education must be directed towards the principles of human-centered AI which still upholds the values of Islamic ethics and spirituality (Fikri et al., 2024).

From an Islamic educational perspective, technology is viewed as a means to achieve public welfare and improve the quality of human life. The use of AI should not diminish the role of teachers as murabbi, mu'allim, and spiritual guides in the educational process (Yusuf, 2023). Teachers still play a primary role in shaping the character, morals, and values of students. Therefore, the integration of technology and AI in Islamic education needs to be balanced between digital innovation and the strengthening of Islamic values to create an adaptive, humanistic education system oriented toward the formation of a perfect human being.

Based on this description, information technology innovation and Artificial Intelligence are crucial issues that need to be studied in the transformation of Islamic education in the digital era. This study is crucial for understanding the use of information technology and AI in Islamic education, the opportunities for their implementation in learning, as well as the challenges and strategies for their

development. Thus, Islamic education is expected to be able to provide an innovative and effective learning system that remains grounded in the values of the Qur'an and Hadith.

RESEARCH METHODOLOGY

This research uses a library research approach with a qualitative descriptive method to examine the use of information technology and Artificial Intelligence (AI) in the transformation of Islamic education in the digital era (Creswell & Poth, 2013). This literature study was chosen because it aligns with the research objectives, namely to analyze, identify, and synthesize various previous research findings related to technological innovation and AI in Islamic education without directly collecting field data. A qualitative descriptive approach was used to provide a systematic overview of the transformation of Islamic education based on digital technology (Sugiyono, 2019).

The data sources for this study were various national and international journal articles, scientific books, proceedings, and official documents from educational institutions and international organizations relevant to the research theme. Data were obtained through searches in academic databases such as Google Scholar, Scopus, DOAJ, Garuda, and official UNESCO sources, with publications spanning 2020–2026. Keywords used in the search process included "Artificial Intelligence in Education," "Islamic Educational Information Technology," "Transformation of Islamic Education," "Digital Learning," "AI in Islamic Education," and "Islamic Smart Classroom."

The source selection criteria for this study included: (1) articles and books discussing the use of information technology and AI in education; (2) research related to the transformation of Islamic education in the digital era; (3) sources published between 2020 and 2026; and (4) sources with academic relevance and complete accessibility. Sources that were irrelevant to the research theme or lacked academic clarity were not used in the analysis process.

Data collection techniques were conducted through documentation and digital literature searches. All data obtained were then analyzed using descriptive thematic analysis techniques, namely by grouping data based on the main research themes, such as the concept of information technology, the implementation of Artificial Intelligence, the transformation of Islamic education, digital learning innovation, and the challenges and ethics of using AI in Islamic education. The analysis was carried out through the stages of data reduction, data presentation, data interpretation, and systematic drawing of conclusions (Miles et al., 2014).

Through this research method, it is hoped that a comprehensive understanding can be obtained regarding the form of utilization of information technology and Artificial Intelligence in the transformation of Islamic education in the digital era, while also providing a conceptual contribution to the development of an innovative, adaptive, and Islamic value-based Islamic education model.

RESULTS AND DISCUSSION

Based on a literature review of various national and international journals from 2020–2026, the transformation of Islamic education in the digital era demonstrates that

the use of information technology and Artificial Intelligence (AI) has significantly impacted learning systems, education management, and human resource development in Islamic educational institutions. The use of digital technology serves not only as a learning support medium but also as an instrument for transforming Islamic education toward a more adaptive, innovative, and digital-first education system.

1. The Concept of Information Technology and Artificial Intelligence in Education

Information technology is a set of digital systems used to manage, store, process, and deliver information in the educational process. In modern education, information technology has become a vital part of the learning process through the use of the internet, multimedia, e-learning, and Learning Management Systems (LMS). The use of information technology enables the learning process to be flexible, effective, and not limited by space and time.

Meanwhile, Artificial Intelligence (AI) is a technology that enables computers or digital systems to mimic human thinking through machine learning, natural language processing, and automated data analysis. In education, AI is used to create adaptive learning systems, virtual tutors, educational chatbots, and automated evaluation systems that can improve learning effectiveness.

In the context of Islamic education, information technology and AI serve as tools to improve the quality of learning, expand access to education, and strengthen the integration of science and Islamic values. The use of these technologies is part of the transformation of Islamic education toward a digital-based education system that remains oriented toward developing students' morals and spirituality.

2. Transformasi Pendidikan Islam di Era Digital

The transformation of Islamic education is a process of changing the education system to adapt to technological developments, societal needs, and global challenges without abandoning the fundamental values of Islamic teachings. This transformation includes changes in learning methods, educational media, evaluation systems, and interaction patterns between teachers and students.

The advancement of the digital era has encouraged Islamic educational institutions to adopt various technological innovations in the learning process. Based on a literature review, the transformation of Islamic education is marked by the increasing use of digital platforms such as e-learning, virtual classrooms, hybrid learning, and digital libraries in Islamic Religious Education (IS) teaching and learning.

Furthermore, the digitalization of Islamic education is also evident in the development of Quran learning applications, online Islamic study platforms, digital libraries of classical texts, and multimedia-based da'wah media. This transformation demonstrates that Islamic education is beginning to move toward a more open, interactive, and information technology-based modern education system.

From an Islamic educational perspective, digital transformation is not merely technological modernization, but also a process of integrating scientific advancement with Islamic spiritual values. Therefore, the use of technology in Islamic education

must continue to address morals, ethics, and the goal of Islamic education as a means of developing perfect human beings.

3. Utilization of Artificial Intelligence in Islamic Education

Research shows that Artificial Intelligence is beginning to be utilized in various aspects of Islamic education, including the learning process, academic evaluation, and educational administration. One example of AI utilization is the use of chatbots and virtual tutors to help students independently understand learning materials.

AI technology also supports adaptive learning systems that can tailor material to students' abilities and needs. This system enables a more personalized and effective learning process, as students gain learning experiences tailored to their individual levels of understanding.

Furthermore, the development of generative AI tools like ChatGPT, Gemini, and Copilot makes it easier for educators to develop teaching materials, create assessment questions, create presentations, and even assist with academic reference searches. The presence of AI helps improve educator efficiency and accelerate educational administration processes.

However, the use of AI in Islamic education must remain under the supervision of educators to prevent technological dependency and misuse of information. Teachers remain the primary role as educators, guiding the intellectual, moral, and spiritual development of students.

4. Islamic Smart Classroom and Digital Learning

One form of innovation in Islamic education in the digital era is the emergence of the Islamic Smart Classroom concept. An Islamic Smart Classroom is a digital technology-based learning space that integrates interactive media with Islamic values into the learning process.

The use of digital learning has a positive impact on increasing student motivation, creativity, and participation in the learning process. Furthermore, digital technology allows for broader and more accessible access to Islamic learning.

5. Challenges of Utilizing Technology and AI in Islamic Education

Despite its numerous benefits, the use of information technology and AI in Islamic education still faces various challenges. Based on a literature review, the main challenges include limited technological infrastructure, low digital literacy among educators, disparities in internet access, and minimal training in the use of technology in learning.

In addition to technical challenges, there are also ethical challenges in using AI in education. Excessive use of AI can lead to technological dependency, reduce students' critical thinking skills, and increase the risk of academic plagiarism. Furthermore, the validity of Islamic information generated by AI also needs to be considered to prevent the dissemination of information inconsistent with Islamic values.

From an Islamic perspective, the use of technology must be based on the principles of public welfare, moral responsibility, and digital ethics. Therefore, the

integration of AI into Islamic education requires oversight, regulation, and strengthening of digital literacy to ensure its wise and responsible use.

6. AI-Based Islamic Education Transformation Strategy

AI-based transformation of Islamic education requires a planned and sustainable strategy. Based on the study, several key strategies can be implemented, including: improving digital literacy and AI competency for educators, developing a digital technology-based curriculum, strengthening the integration of Islamic values in the use of AI, developing educational technology infrastructure, and building collaboration between educational institutions and the technology industry.

Furthermore, Islamic education needs to develop a humanistic learning model that positions technology as a learning support tool, not a substitute for the teacher. AI integration should be directed toward strengthening the quality of learning, building student character, and creating an innovative Islamic education ecosystem oriented toward the values of the Quran and Hadith.

Thus, the transformation of Islamic education in the digital era through the use of information technology and Artificial Intelligence is a strategic step in creating a modern, effective, and relevant education system with the development of the times without abandoning Islamic identity and values.

CONCLUSION

Based on the results of a literature review, information technology and Artificial Intelligence (AI) play a crucial role in transforming Islamic education in the digital era through more effective, flexible, interactive, and adaptive learning. Various uses of AI, such as virtual tutors, learning evaluations, and digital media, can improve the quality of learning. However, their implementation still faces challenges such as limited infrastructure, low digital literacy, and ethical issues.

To optimize the use of AI, Islamic educational institutions need to strengthen their infrastructure, improve digital literacy, and provide training for educators. Furthermore, curriculum development and regulations must integrate technology with Islamic values to ensure that educational transformation remains oriented toward developing students' character, morals, and spirituality.

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