

Integration of Artificial Intelligence in 21st Century Education: Analysis of Opportunities and Implications for Islamic Values

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ABSTRACT

This study examines the opportunities and challenges of artificial intelligence (AI) in 21st-century education and offers an ethical and humanistic perspective aligned with Islamic educational values. The purpose of this study is to analyze the potential of AI to improve the quality of learning while reviewing potential negative impacts. This study uses a desk study method by reviewing scientific literature related to the application of AI in education. The novelty of this study lies in the integration of ethical perspectives and Islamic educational values, a topic rarely addressed in previous studies. The results indicate that AI can improve learning effectiveness through personalized materials, administrative automation, and expanded access. However, the application of AI also poses challenges such as reduced human interaction, the digital divide, and issues of ethics and data privacy. The synthesis of the findings emphasizes the importance of utilizing AI that upholds humanitarian values and the principles of justice in Islamic education. This study has implications for the development of AI-based learning that remains human-centered and based on Islamic spiritual values.

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INTRODUCTION

The transformation of digital technology in the 21st century has significantly transformed the teaching and learning process, including through the emergence of artificial intelligence (AI), which is beginning to be utilized to support personalized learning, teaching effectiveness, and administrative automation. The increasing use of AI demonstrates that

technology is not just a tool, but also a strategic component in improving the quality of education. This use of technology aligns with the demands of 21st-century skills, such as critical thinking, creativity, collaboration, and communication (the 4Cs).

In the context of national policy, Article 3 of Law Number 20 of 2003 concerning the National Education System stipulates that national education has the function of developing capabilities, shaping the character and civilization of a dignified nation in order to educate the nation (Habe & Ahiruddin, 2017). Based on this, the use of technology, including artificial intelligence, must be aimed at the development of the Indonesian nation as a whole, including intellectual, moral, and spiritual aspects. However, on the other hand, the application of AI presents new challenges. In theory, AI is believed to be able to improve the quality of learning through personalization, automatic evaluation, and adaptation of materials according to student needs (Farhood et al., 2025). However, in reality, many problems still arise in the field, such as reduced human interaction in learning, the digital literacy gap, and ethical issues related to student data protection, so that an educational approach that still places human values at its center is needed.

Various previous studies have shown that artificial intelligence has great potential in increasing the effectiveness of learning. Holmes et al. (2019) emphasized that the application of artificial intelligence can improve the effectiveness of learning. *AI-based tutoring systems* can improve student motivation and learning outcomes through a personalized approach. A study (Ronsumbre et al., 2023) confirmed that AI has become a crucial part of digital learning and contributed to accelerating educational innovation. Meanwhile, (Nugroho et al., 2025) identified teachers' limited digital competency as a major obstacle to implementing AI technology.

These various studies show that the successful use of AI is determined not only by the technology, but also by the readiness of human resources and the ethics of its use. Although AI is theoretically believed to improve the quality of learning through personalization and automation, in practice, several obstacles remain, such as low teacher digital literacy, limited school infrastructure, and ethical and data privacy issues. This indicates a gap between the ideal potential of AI and its actual implementation in educational settings. Furthermore, Holmes et al. (2022) emphasize that the use of AI in education must consider ethical aspects such as fairness, algorithmic transparency, student privacy rights, and learner autonomy. They highlight that excessive reliance on AI systems can diminish the role of teachers as humanistic mediators, so technology needs to be directed to support human interaction, not replace it.

UNESCO also emphasized the importance of an ethical and humanistic approach to the use of artificial intelligence. UNESCO emphasized that the application of AI in education must be based on an ethical approach namely placing human beings, human values, and the dignity of students at the heart of the learning process.

UNESCO (n.d.) emphasizes that AI technology should not replace the role of teachers, but rather serve as a supporting tool to strengthen learning that is fair, inclusive, transparent, and oriented towards holistic human development. From an Islamic perspective, technology integration must align with the values of the Quran, particularly Surah Al-'Alaq, verses 1–5, which emphasizes the importance of knowledge, learning, and the well-being of humanity. However, research explicitly linking the use of AI to Islamic educational principles remains scarce, leaving little in-depth analytical scope in this area.

Furthermore, most research on AI in education still focuses on technical and pedagogical aspects. Few studies have systematically discussed the integration of AI with Islamic values in the context of 21st-century education. The novelty of this research lies in its integrative analysis, which not only addresses the use of AI from a technological and pedagogical perspective but also emphasizes its application through the perspective of humanizing Islamic education as a foundation for ethics, morals, and spirituality. By strengthening the integration of AI and humanizing education, this research addresses the gap between AI's potential and actual practice in Indonesia, while highlighting the need for implementation strategies that address humanitarian values, ethics, and justice.

Based on the description above, the formulation of the research problem is: (1) what are the opportunities and challenges of utilizing artificial intelligence in improving the quality of learning in Indonesia, and (2) how the concept of humanization of education from an Islamic perspective can be applied in the use of AI so that it continues to uphold the values of humanity, ethics, and justice. The purpose of this research is to analyze the potential and risks of using AI in education and to provide a conceptual and reflective overview of its implementation strategy so that it is in line with human values. By emphasizing the integration of AI oriented towards humanism, this research also aims to identify best practices that can be implemented by educators and educational institutions in Indonesia. This research also explores the principles of Islamic education as an ethical and spiritual foundation to guide the use of AI in a wise and civilized manner.

Discussions on artificial intelligence in education focus not only on the technological aspects but also on placing humans and humanity at the heart of the educational process in the digital age. Within the framework of 21st-century education, technological innovation should remain grounded in the moral and spiritual values that underlie education. This aligns with the view (Sofa et al., 2023) that the educational process must continue to instill moral and humanitarian values, which are the primary goals of learning.

METHODS

This research was conducted using a qualitative method based on a literature review to examine the various opportunities and challenges of utilizing artificial

intelligence (AI) in 21st-century education from the perspective of humanizing Islamic education. The research design was descriptive and analytical, employing thematic content analysis techniques to enable the researcher to interpret the data reflectively, comprehensively, and contextually. This approach was chosen because it is relevant to examining theoretical ideas, previous research findings, and educational policy documents related to AI, technology ethics, and Islamic educational values.

The research data comes from scientific literature including articles from Sinta-accredited national journals, international journals, scientific books, research reports, and official documents from UNESCO. The literature was selected using inclusion criteria in the form of: (1) publications in the last ten years (2015–2025), (2) relevant to the topics of artificial intelligence, 21st-century education, and technology ethics, and (3) having a clear academic reputation.

The data collection process was carried out by systematically searching for references in databases such as Scopus, Google Scholar, DOAJ, and Sinta with the keywords "artificial intelligence", "AI in education", "AI ethics", and "Islamic educational values". The data were analyzed using the following stages: (1) organizing the literature, (2) initial coding to find keywords and main issues, (3) grouping themes such as personalized learning, technology ethics, humanization of education, and the principle of *maslahah*, and (4) interpreting the findings based on the *akhlaq al-karimah* framework. Data validity was strengthened through source triangulation, comparison of findings between literatures, and verification of theme consistency.

FINDINGS AND DISCUSSION

Results of literature review

This study was conducted through a literature study by examining articles, journals, books, research reports and academic documents that discuss AI in education and its relationship with the concept of humanization of Islamic education. The research process is carried out through the stages of source identification, relevance selection, content analysis, and synthesis of findings.

A literature review shows that artificial intelligence (AI) is defined as a simulation of human intelligence programmed into machines to think like humans. The Oxford Dictionary describes AI as the development of computer systems that enable machines to perform tasks requiring human intelligence (Sandra, 2023). In education, AI is understood as intelligent algorithms that aid learning, assessment, and educational management.

AI applications include *intelligent tutoring systems*, *learning analytics*, as well as learning recommendation systems that personalize the learning experience (Holmes et al., 2019). Fernández et al. (2021) outline that the use of AI includes chatbots, automated assessments, intelligent tutoring, and student achievement predictions. Nurbaity et al. (2023) state that AI helps teachers expand learning methods. Researchers Joe & Omar (n.d.) demonstrate the potential of AI in tailoring learning

content to student abilities. Meanwhile, Thoha bin Misro (2025) emphasizes that personalized learning must align with Al-Ghazali's view of the function of reason as an instrument for acquiring knowledge.

AiCI (2024) explains that AI-based automated assessments accelerate evaluation. Researchers Astutik et al. (2023) show that AI helps students understand learning weaknesses through data analysis. Similarly, Yahya (2023) emphasizes that AI automates educational administration, allowing teachers to focus on character development. This also aligns with the concept of ta'dib according to al-Attas (Sunnah et al., 2025).

UNESCO emphasized that AI expands access to global education. Meanwhile, Oktavianus et al. (2023) and Bura & Myakala (2024) demonstrated that AI enhances creativity through simulations and gamified learning. Maola et al.'s (2024) study included various AI applications in the classroom, such as virtual mentors and presentation translators. Researchers Chatterjee & Bhattacharjee (2020) demonstrated that AI enhances learning motivation through interactivity.

However, Jamilah et al. (2024) emphasized that teachers still lack digital competency. Tan et al. (2025) found a significant gap between AI training and teacher needs. Saubestre (2024) highlighted the issue of data transparency, while Taruklimbong et al. (2023) emphasized the need for personal data protection. A study by Firdaus et al. (2025) found a decline in critical thinking skills due to reliance on AI. Similarly, Hasanah (2018) emphasized that education must honor human dignity. And Irmawati & Rusdin (2025) warned of the risk of dehumanization if teachers are replaced by AI. Furthermore, Turnando et al. (2025) explained that the cost of implementing AI remains a barrier for many schools. All Islamic literature emphasizes the principles of trustworthiness, justice, hifz al-'ird, maslahah, and moral responsibility in the use of AI.

Based on a thematic analysis of the entire literature, this study yields several important findings. First, AI functions not only as a technological tool but has evolved into an adaptive pedagogical ecosystem that builds personalized and responsive learning experiences. Second, the integration of AI in education has the potential to strengthen the principle of humanization if its use remains under the control of teachers, rather than replacing it. Third, this study finds a strong connection between AI's potential for personalized learning and the concept of al-'aql in Islamic tradition, thus AI has the potential to strengthen ethical intellectual development. Fourth, this study identifies that digital challenges are not merely technical issues but also issues of ethics, fair access, and teacher readiness, so that AI implementation must be grounded in the values of maqasid sharia. Furthermore, this study finds that the risk of declining critical thinking skills is highly AI in learning; if not properly directed, AI can weaken students' reflective abilities.

The opportunities and challenges of utilizing artificial intelligence (AI) to improve the quality of learning in Indonesia, as well as how the concept of humanizing Islamic

education can be applied so that the use of AI continues to uphold the values of humanity, ethics, and justice. Research findings obtained through thematic analysis indicate that AI offers significant opportunities to strengthen the learning process, particularly in aspects of personalization, assessment effectiveness, expanding educational access, increasing creativity, and increasing student learning motivation. By learning AI, students can use AI technology to solve problems in everyday life (Klarisa et al., 2023). This finding aligns with Holmes et al. (2019) who emphasized that AI can support adaptive learning based on individual student needs, and is reinforced by (Efendi et al., 2025) who found that the use of AI increases student engagement and participation through personalized feedback.

These potentials are derived from literature analysis that discusses the basic concepts of AI (Sandra, 2023), its use in adaptive learning systems (Holmes et al., 2019), assessment automation (AiCI, 2024), increased creativity (Oktavianus et al., 2023; Bura & Myakala, 2024), and increased learning motivation (Chatterjee & Bhattacharjee, 2020). These findings align with international research showing that AI integration, including generative AI like ChatGPT, can significantly improve student engagement and learning experiences through personalization and adaptive support (Farhood et al., 2025). However, other studies highlight potential risks, such as decreased social interaction. Emotional and dependence on technology, which can reduce critical thinking skills if not balanced with the right pedagogical approach (Firdaus et al., 2025). Thus, the results of the literature show that AI has become a pedagogical instrument that can improve the quality of learning, but its effectiveness depends on the context of implementation and the readiness of educators.

Interpretation of these findings suggests that AI's potential in learning lies not only in technical aspects, but also in its ability to create a more humane and learner-centered learning experience. When AI is able to adapt the curriculum to individual abilities, as explained by Joe & Omar (n.d.), this reinforces the principle of intellectual development (al-'aql) in Islamic education as proposed by Al-Ghazali (Thoha bin Misro, 2025). The reason for this finding is that AI personalization provides immediate feedback, adjusts the difficulty level of the material, and allows students to learn at their own pace, thereby increasing motivation and creativity.

Personalized learning through AI provides space for each student to develop according to their unique potential, which aligns with the goals of Islamic education to foster intellectual independence and shape civilized individuals. Furthermore, providing feedback through AI aligns with the Islamic concept of *tarbiyah* (Islamic education), which emphasizes both the improvement of knowledge and the development of students' character. AI-enabled creativity is a manifestation of human capacity as *khalifah fil ardh* (vicegerents on earth) to cultivate, create, and prosper the earth. Implementation of AI in learning, such as *asmentor virtual*, *voice assistant*, *smart content*, *dan presentation translator*, provides a practical means to realize personalization, creativity, and active student engagement in the learning process.

The practical implication is that teachers can utilize this technology as a tool to support adaptive and creative learning while still acting as moral and intellectual guides for students.

Despite its enormous potential, the implementation of AI in education still faces significant obstacles. These include limited digital infrastructure in Indonesian schools (Jamilah et al., 2024), low teacher digital literacy, which results in pedagogical unpreparedness in effectively utilizing AI-based technologies (Tan et al., 2025), and related data privacy and security issues.

The protection of students' rights and dignity in the digital ecosystem (Saubestre, 2024; Taruklimbong et al., 2023) is a major obstacle to the optimal use of AI. These challenges demonstrate that AI issues are not merely technological, but also a matter of human readiness and the education system. This is evident in the findings of Firdaus et al. (2025) who stated that excessive reliance on AI has the potential to reduce students' critical thinking skills. From an Islamic perspective, this condition contradicts the concept of strengthening the mind (*tazkiyat al-'aql*), which requires students to actively think, rather than simply accepting automatic answers from technology. Thus, this discussion confirms the results of previous research and provides a new interpretation that the challenges of AI need to be understood as ethical and pedagogical challenges, not merely technical ones.

Furthermore, this study found that the concept of humanization of Islamic education can serve as an ethical framework for the use of AI. The principles of trustworthiness, etiquette, justice (*'adl*), and protection of human dignity (*hifz al-'ird*) as explained by Hasanah (2018) and Irmawati & Rusdin (2025) provide important guidelines to ensure that the use of AI does not displace the role of teachers as spiritual, moral, and intellectual guides. Similarly, Irpani (2025) emphasized that AI in Islamic education should be positioned as a means of education, not as a substitute for the role of educators, while Ajizah et al. (2025) emphasized the importance of making *maqāṣid al-sharī'ah* the ethical framework for the development and use of AI. It is in this context that the research findings provide a new contribution, namely that the integration of AI in Islamic education must be based on *maqāṣid sharia*, especially in maintaining reason, upholding honor, and bringing benefits. Teachers remain in control of the use of AI, while technology serves as a tool that enhances the learning process, not an authority that replaces human interaction.

By linking all these findings, this discussion demonstrates that AI holds significant potential for improving the quality of Indonesian education. However, this potential can only be realized if accompanied by teacher competency readiness, equitable infrastructure, and the implementation of a strong ethical framework. This is because AI has the potential to be a strategic tool in creating adaptive, interactive, and inclusive learning without eliminating human values (Ariannor, 2025; Anandal et al. 2024). This research produces a new theoretical modification in the form of an integration between AI-based pedagogy and the principles of Islamic humanization, which emphasize that technological advances must be directed towards strengthening

human reason, character, and dignity. The implication for educational practice is that teachers can use AI as an innovative tool while still instilling moral, spiritual, and ethical values in learning. Thus, the use of AI in education aligns with the vision of Islamic education, creating civilized individuals who are technologically proficient but still uphold spiritual and humanitarian values.

CONCLUSION

Artificial intelligence (AI) has the potential to improve the quality of learning through personalization, assessment effectiveness, expanded access, and increased creativity and student learning motivation when implemented ethically and humanely. AI integration based on the humanization of Islamic education can strengthen the role of teachers as moral, spiritual, and intellectual educators, while maintaining the function of reason and human dignity. Key findings indicate that AI can support learning differentiation according to individual needs, facilitate more objective evaluation, and enhance student collaboration and interaction through digital media. Furthermore, the ethical use of AI strengthens character formation and religious values, as well as promotes digital literacy and 21st-century skills. The contribution of this research lies in the development of an integrative framework between AI-based pedagogy and the principles of *maqāṣid al-sharī'ah* as the ethical foundation for the use of educational technology. Therefore, Further research is recommended to empirically test the application of humanization-based AI, while supporting it with increased teacher competency, ethical policies, and equitable digital infrastructure.

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