

The Utilization of Artificial Intelligence (AI) to Enhance the Effectiveness of Islamic Religious Education Learning in Elementary Schools

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Abstract

The rapid development of Artificial Intelligence (AI) has created new opportunities to improve the effectiveness of Islamic Religious Education (IRE) learning in elementary schools through more innovative, interactive, and adaptive instructional approaches (UNESCO, 2023; Kasneci et al., 2023). This study aims to analyze the utilization of AI in enhancing the effectiveness of IRE learning while identifying its opportunities and implementation challenges. The study employed a library research method using a qualitative descriptive approach. Data were collected from relevant books, scholarly journals, and conference proceedings and analyzed through data reduction, data presentation, and conclusion drawing. The findings indicate that AI assists teachers in designing instructional materials, developing learning media and assessment instruments, providing timely feedback, and increasing students' motivation and engagement in the learning process (Lo, 2023; Zulkifli & Suyadi, 2024). However, its implementation continues to face several challenges, including limited digital literacy among teachers, inadequate technological infrastructure, and ethical concerns regarding the use of AI in education (UNESCO, 2023). Therefore, AI should be utilized as a supportive educational technology that complements teachers' professional roles while preserving their essential responsibility in fostering Islamic values and developing students' character.

Keywords: Artificial Intelligence, Islamic Religious Education, learning effectiveness, elementary school.

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Introduction

The rapid advancement of digital technology has significantly transformed various aspects of human life, including the field of education. One of the most prominent technological innovations is Artificial Intelligence (AI), which refers to technology capable of simulating human cognitive abilities in processing information, analyzing data, and generating various forms of content automatically. The emergence of AI has opened new opportunities to enhance the quality of education by providing learning experiences that are more adaptive, personalized, and interactive. UNESCO (2023) emphasizes that AI has considerable potential to support educational transformation; however, its implementation should remain human-centered while taking ethical considerations, security, and educational quality into account.

The digital transformation of education is also driven by the demands of 21st-century learning, which require students to develop critical thinking, creativity, communication, collaboration, and digital literacy skills. Consequently, teachers are expected to integrate technology into the teaching and learning process to provide students with meaningful learning experiences that meet the needs of an increasingly digital society (Southworth et al., 2023). In this context, AI has emerged as an innovative educational tool capable of assisting teachers in designing instructional materials, developing interactive learning media, creating assessments, and evaluating student learning outcomes more efficiently (Kasneci et al., 2023).

In Indonesia, the adoption of AI in education has increased alongside the implementation of the Merdeka Curriculum, which emphasizes differentiated instruction, the development of 21st-century competencies, and the integration of digital technology into classroom learning. AI enables teachers to provide more personalized learning experiences by accommodating students' diverse abilities, interests, and learning needs. Furthermore, AI can reduce teachers' administrative workload, allowing them to devote more time to implementing student-centered learning strategies (Lo, 2023).

Islamic Religious Education (IRE) plays a crucial role in fostering students' faith, piety, moral values, and character development. Therefore, IRE learning is not merely oriented toward the acquisition of religious knowledge but also toward cultivating attitudes and behaviors that reflect Islamic values. Consequently, IRE teachers are expected to design meaningful, engaging, and contextual learning experiences that encourage students not only to understand Islamic teachings but also to practice them in their daily lives (Parhan & Azizah, 2023).

The integration of AI into IRE learning offers numerous opportunities to improve instructional quality. Teachers can utilize AI to develop lesson modules, create image- and video-based learning media, design Higher-Order Thinking Skills (HOTS) assessment items, implement differentiated instruction, and provide immediate feedback on students' learning outcomes. In addition, generative AI applications enable teachers to simplify religious concepts according to elementary school students' cognitive development, making learning activities more engaging and easier to understand (Mollick & Mollick, 2023; Zulkifli & Suyadi, 2024).

Despite these potential benefits, implementing AI in IRE learning also presents several challenges. One of the primary issues is the varying levels of teachers' digital literacy. Not all teachers possess adequate competencies to integrate AI effectively into classroom instruction. Moreover, limited technological infrastructure, internet accessibility, and digital devices in

many schools continue to hinder the successful implementation of AI (Setiawan, 2023). In addition, the use of AI raises ethical concerns, including misinformation (*hallucinations*), plagiarism, and the misuse of AI-generated content if appropriate supervision is lacking (Creely, 2026).

From the perspective of Islamic Religious Education, AI should always be utilized within the framework of Islamic values. Information generated by AI should not be accepted uncritically but must undergo the process of *tabayyun* (verification). IRE teachers remain responsible for ensuring that instructional content is consistent with the Qur'an, Hadith, and the opinions of credible Islamic scholars. Therefore, AI should function as a supporting instructional tool, while the internalization of Islamic values, moral development, and exemplary character remain the primary responsibilities of teachers (Rahman, 2023; Djazilan et al., 2024).

Previous studies have demonstrated that AI positively contributes to improving learning quality, increasing student motivation, and enhancing teachers' instructional efficiency (Kasneci et al., 2023; Lo, 2023). Nevertheless, most existing studies focus on education in general or higher education contexts. Research specifically investigating the utilization of AI in Islamic Religious Education at the elementary school level remains limited. This represents a significant research gap, considering that IRE at the elementary level emphasizes not only cognitive achievement but also the development of religious attitudes, moral character, and habitual religious practices.

Based on these considerations, this study aims to analyze the utilization of Artificial Intelligence in enhancing the effectiveness of Islamic Religious Education learning in elementary schools. Furthermore, it seeks to identify the forms of AI utilization, examine its potential benefits, and explore the challenges associated with its implementation. The findings are expected to contribute to the theoretical development of technology-enhanced Islamic Religious Education and provide practical recommendations for teachers and policymakers in integrating AI effectively, ethically, and in accordance with Islamic educational values.

Literature Review

1. Artificial Intelligence in Education

Artificial Intelligence (AI) refers to computer systems capable of performing tasks that typically require human intelligence, including learning, reasoning, problem-solving, decision-making, and natural language processing (Russell & Norvig, 2021). In recent years, AI has become one of the most influential technological innovations in education, offering new opportunities to improve teaching quality, personalize learning experiences, and support data-driven educational decision-making. UNESCO (2023) emphasizes that AI should be implemented as a human-centered technology that promotes educational equity, inclusion, and quality while respecting ethical principles.

Within educational settings, AI has been widely adopted to support instructional planning, automate administrative tasks, develop intelligent tutoring systems, generate learning resources, and provide immediate feedback to learners (Kasneci et al., 2023). The emergence

of generative AI tools such as ChatGPT has further expanded teachers' opportunities to create instructional materials, lesson plans, assessment instruments, and interactive learning media more efficiently (Lo, 2023). Consequently, AI is increasingly recognized as an educational innovation capable of improving both teaching effectiveness and student learning outcomes.

2. Artificial Intelligence in Islamic Religious Education

The integration of AI into Islamic Religious Education (IRE) provides opportunities to modernize instructional practices while maintaining the fundamental objectives of Islamic education. AI enables teachers to present Islamic concepts through multimedia resources, interactive learning activities, adaptive assessments, and personalized learning experiences. Such innovations can increase students' motivation and engagement while facilitating a deeper understanding of Islamic teachings (Zulkifli & Suyadi, 2024).

However, AI should not be regarded as a substitute for teachers in IRE. Islamic education emphasizes not only cognitive achievement but also the development of faith (*iman*), morality (*akhlaq*), spirituality, and religious character. These educational objectives require direct interaction, exemplary behavior (*uswah hasanah*), and continuous guidance from teachers. Therefore, AI should function as a complementary instructional tool, whereas teachers remain responsible for cultivating students' moral and spiritual development (Djazilan et al., 2024).

Furthermore, AI-generated content requires careful verification before being incorporated into Islamic Religious Education. Teachers should ensure that instructional materials are consistent with authentic Islamic sources, including the Qur'an, Hadith, and recognized scholarly interpretations. This verification process reflects the Islamic principle of *tabayyun*, which emphasizes the importance of validating information before accepting or disseminating it (Rahman, 2023).

3. Learning Effectiveness

Learning effectiveness refers to the extent to which instructional objectives are successfully achieved through meaningful improvements in students' knowledge, skills, attitudes, and learning behaviors (Slavin, 2018). Effective learning is characterized by active student participation, high learning motivation, appropriate instructional strategies, and continuous assessment that supports learning improvement.

The integration of AI contributes to learning effectiveness by enabling personalized instruction, improving classroom engagement, facilitating timely feedback, and supporting differentiated learning approaches (Yim, 2024). AI also reduces teachers' administrative workload, allowing them to devote more attention to instructional interactions and individualized student guidance (Southworth et al., 2023). These advantages are particularly relevant in elementary education, where students require diverse instructional strategies according to their developmental characteristics.

4. Conceptual Framework

This study is based on the assumption that the effective utilization of AI can enhance the quality of Islamic Religious Education learning in elementary schools. AI supports teachers in instructional planning, learning implementation, and assessment while improving students' motivation and engagement. Nevertheless, the successful integration of AI depends on teachers' digital competencies, adequate technological infrastructure, ethical AI utilization, and continuous verification of instructional content to ensure its alignment with Islamic educational principles.

Accordingly, AI should be viewed not as a replacement for teachers but as an educational innovation that strengthens teachers' professional competencies and supports more effective, interactive, and student-centered Islamic Religious Education.

Research Method

This study employed a library research method using a qualitative descriptive approach. This method was selected to comprehensively examine the utilization of Artificial Intelligence (AI) in enhancing the effectiveness of Islamic Religious Education (IRE) learning in elementary schools based on relevant scholarly literature.

The data used in this study consisted of secondary data obtained from national and international scientific journals, academic books, conference proceedings, and other scholarly publications discussing the application of AI in education, particularly in the context of Islamic Religious Education. To ensure the relevance and currency of the findings, the literature reviewed primarily comprised publications published between 2022 and 2026, reflecting recent developments in AI technology and educational research.

Data collection was conducted through document analysis, involving the systematic identification, selection, and review of literature relevant to the research objectives. The collected data were subsequently analyzed using content analysis, which included the processes of data reduction, data display, interpretation, and conclusion drawing. This analytical procedure was employed to identify the forms of AI utilization, its educational benefits, and the challenges associated with its implementation in Islamic Religious Education learning at the elementary school level.

To enhance the trustworthiness of the findings, this study applied source triangulation by comparing and synthesizing evidence from multiple scholarly sources and expert perspectives. This approach ensured that the findings were objective, comprehensive, and academically reliable.

Results and Discussion

1. Artificial Intelligence as an Innovation in Islamic Religious Education Learning

The rapid advancement of Artificial Intelligence (AI) has transformed educational practices from conventional teacher-centered approaches toward more digital, adaptive, and student-centered learning environments (UNESCO, 2023; Kasneci et al., 2023). In the context

of Islamic Religious Education (IRE), AI serves as a supportive technology that assists teachers in designing instructional materials, developing interactive learning media, creating assessment instruments, and providing timely feedback to students (Lo, 2023). Furthermore, the integration of AI aligns with the demands of 21st-century education, which emphasize digital literacy, critical thinking, creativity, communication, and collaboration (Southworth et al., 2023).

The findings of this literature review indicate that AI is not intended to replace teachers but rather to strengthen their professional competencies in designing more effective learning experiences. Various generative AI platforms can be utilized to develop lesson plans, summarize learning materials, generate instructional illustrations, create Higher-Order Thinking Skills (HOTS) assessment items, and produce engaging visual learning resources (Mollick & Mollick, 2023). In elementary school IRE, AI enables teachers to present topics such as Aqidah (Islamic creed), Fiqh (Islamic jurisprudence), Akhlaq (Islamic ethics), the Qur'an, and Islamic history in language that is more appropriate to students' cognitive development (Zulkifli & Suyadi, 2024).

2. Forms of AI Utilization in Islamic Religious Education Learning

The literature review demonstrates that AI can be integrated into every stage of the instructional process, including planning, implementation, and assessment.

During the planning stage, AI assists teachers in developing learning outcomes, learning objectives, teaching modules, instructional indicators, assessment rubrics, and evaluation instruments more efficiently (Kasneci et al., 2023). It also provides access to a wider range of instructional resources, enabling teachers to improve the quality and diversity of lesson planning (UNESCO, 2023).

During the implementation stage, AI can be employed to create interactive learning media such as images, videos, animations, digital quizzes, educational games, and instructional simulations that enhance students' attention and participation (Olga et al., 2023). These digital resources facilitate students' understanding of abstract Islamic concepts by presenting them in more engaging and accessible formats (Parhan & Azizah, 2023).

At the assessment stage, AI supports teachers in generating multiple-choice questions, essay questions, and HOTS-based assessments more efficiently (Mollick & Mollick, 2023). Additionally, AI can provide immediate formative feedback on students' performance, enabling teachers to focus more on individualized guidance and learning support (Lo, 2023).

3. The Contribution of AI to the Effectiveness of Islamic Religious Education Learning

Learning effectiveness is reflected in the achievement of instructional objectives through improved student understanding, motivation, participation, and learning outcomes (Slavin, 2018). The reviewed studies indicate that AI contributes substantially to improving the effectiveness of Islamic Religious Education.

First, AI enhances teachers' instructional efficiency by reducing the time required to prepare lesson plans, learning materials, and assessment instruments without compromising instructional quality (Lo, 2023). Consequently, teachers can allocate more time to mentoring students and facilitating meaningful learning experiences (UNESCO, 2023).

Second, AI increases students' learning motivation by presenting instructional content in interactive and engaging formats. The use of visual media, digital quizzes, and gamification-based learning creates enjoyable learning environments that encourage active student participation (Olga et al., 2023).

Third, AI supports personalized learning by adapting instructional materials and learning activities to students' individual abilities and learning needs (Yim, 2024). This capability is consistent with the implementation of differentiated instruction promoted by Indonesia's Merdeka Curriculum (Southworth et al., 2023).

4. Challenges in Implementing AI in Islamic Religious Education

Despite its numerous advantages, the implementation of AI in IRE learning also presents several challenges. One major concern is the varying levels of teachers' digital literacy. Many teachers still lack sufficient knowledge and skills to integrate AI effectively into classroom instruction, highlighting the need for continuous professional development and digital competency training (UNESCO, 2023; Setiawan, 2023).

Another challenge involves the limited availability of technological infrastructure, including internet connectivity, digital devices, and educational technology resources, particularly in schools located in underserved areas (Wang et al., 2022). These limitations hinder the equitable implementation of AI-based learning across educational institutions.

Furthermore, issues related to information accuracy and ethical considerations remain significant. AI-generated content may occasionally contain inaccurate information or lack reliable academic references (Creely, 2026). Within Islamic Religious Education, teachers are responsible for verifying all instructional content against authentic sources, including the Qur'an, Hadith, and authoritative scholarly opinions, before incorporating it into classroom instruction (Rahman, 2023). Therefore, AI should be regarded solely as a supporting technology, while moral education, character development, and value internalization remain the fundamental responsibilities of teachers (Djazilan et al., 2024).

5. Implications of AI for Islamic Religious Education Teachers

The integration of AI requires IRE teachers to continuously develop their pedagogical, professional, and digital competencies (Setiawan, 2023). Teachers should not only be capable of operating AI technologies but also possess the critical ability to evaluate, validate, and appropriately utilize AI-generated information (UNESCO, 2023). In this regard, AI functions as a pedagogical support tool that enhances instructional quality rather than replacing teachers' professional roles.

Moreover, teachers should integrate Islamic ethical values into AI utilization, including honesty, responsibility, *tabayyun* (verification), and ethical digital citizenship (Rahman, 2023). Such an approach enables students not only to develop digital competencies but also to use technology responsibly in accordance with Islamic principles (Zulkifli & Suyadi, 2024).

6. Discussion

The findings suggest that the integration of AI contributes positively to the effectiveness of Islamic Religious Education when implemented appropriately and proportionally (Kasneci

et al., 2023; UNESCO, 2023). AI enhances lesson planning, enriches instructional media, accelerates assessment processes, and supports more adaptive and student-centered learning environments (Lo, 2023). These findings indicate that AI integration represents an important aspect of educational transformation that must be accompanied by improvements in teachers' professional competencies and the reinforcement of Islamic values throughout the learning process (Southworth et al., 2023).

Therefore, successful AI implementation in elementary schools requires adequate digital infrastructure, continuous teacher training, clear ethical guidelines for AI utilization, and rigorous quality control of instructional materials (UNESCO, 2023). Through these efforts, AI can become an effective educational innovation that improves the quality of Islamic Religious Education while preserving its fundamental mission of nurturing students' faith, moral character, and Islamic values (Djazilan et al., 2024).

Conclusion

The findings of this study indicate that the utilization of Artificial Intelligence (AI) makes a significant contribution to enhancing the effectiveness of Islamic Religious Education (IRE) learning in elementary schools. AI supports teachers in designing instructional materials, developing interactive learning media, preparing assessment instruments, and providing timely and efficient feedback. In addition, AI promotes more adaptive and personalized learning experiences, increases students' learning motivation, and facilitates the implementation of differentiated instruction based on students' characteristics and learning needs (Kasneci et al., 2023; Lo, 2023; UNESCO, 2023; Yim, 2024).

Despite these advantages, the implementation of AI in IRE learning continues to face several challenges, including teachers' limited digital literacy, unequal access to technological infrastructure, and the need to ensure the accuracy and ethical use of AI-generated content in teaching Islamic values (Setiawan, 2023; Creely, 2026; UNESCO, 2023). Therefore, the effective integration of AI requires continuous professional development for teachers, improved digital infrastructure, and systematic verification of AI-generated information to ensure its consistency with authentic Islamic sources (Rahman, 2023; Djazilan et al., 2024).

In conclusion, AI cannot replace the essential role of teachers as educators, mentors, and role models in fostering students' character and internalizing Islamic values. Instead, AI should be positioned as a complementary educational technology that enhances instructional quality and teachers' professional practice. The appropriate, ethical, and responsible integration of AI has the potential to create more effective, innovative, and relevant Islamic Religious Education learning that meets the demands of the digital era while preserving the fundamental objectives of Islamic education (Southworth et al., 2023; Zulkifli & Suyadi, 2024).

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