

Challenges in Integrating Artificial Intelligence into Digital Teaching and Learning in Islamic Education

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DOI Link: <http://dx.doi.org/10.6007/IJARPED/v15-i3/28706>

Published Online: 10 August 2026

Abstract

The rapid advancement of digital technology has significantly transformed the education system, including the field of Islamic Education. One of the emerging technologies that has attracted considerable attention is Artificial Intelligence (AI), which is increasingly being integrated into digital teaching and learning. The integration of AI in education enables learning to become more interactive, flexible, and student-centred through the use of adaptive learning applications, educational chatbots, intelligent tutoring systems, and automated assessment tools. In the context of Islamic Education, AI has the potential to support teachers in teaching the Qur'an, *tajwid*, memorisation (*hifz*), and the development of more innovative digital teaching and learning materials. Nevertheless, the adoption of AI in education also presents several challenges, including ethical concerns, the accuracy and authenticity of Islamic content, data security, and teachers' competency in effectively utilising AI technologies. Therefore, this conceptual paper aims to discuss the integration of Artificial Intelligence in digital teaching and learning within Islamic Education, with particular emphasis on the forms of AI application, its significance, and the challenges encountered by Islamic Education teachers. This study employs a document analysis approach based on a review of relevant literature, including journal articles, scholarly publications, and reports related to digital education and AI in education. The findings suggest that AI has the potential to enhance the effectiveness of teaching and learning in Islamic Education when implemented systematically, ethically, and in accordance with the principles and values of Islamic Education.

Keywords: Artificial Intelligence, Digital Education, Islamic Education, Teaching and learning, Educational Technology

Introduction

The rapid advancement of digital technology in the twenty-first century has accelerated the integration of Artificial Intelligence (AI) into education as an innovative approach to enhancing the effectiveness of teaching and learning (T&L). AI refers to the capability of computer systems to perform tasks that typically require human intelligence, such as analysing information, generating content, making predictions, and supporting adaptive

learning. In the educational context, AI has the potential to assist teachers in providing more flexible, personalised, and student-centred learning experiences through applications such as intelligent tutoring systems, instructional content generation, and automated assessment (U.S. Department of Education, 2023). Nevertheless, the integration of AI into teaching and learning also presents various challenges that require careful attention to ensure its effective and ethical implementation. Garzón (2025) argues that the successful implementation of AI necessitates a transformation of traditional pedagogical practices, together with the enhancement of teachers' digital competencies, to enable technology to be effectively integrated into classroom instruction.

Furthermore, Ng, Chan, and Lo (2025) identified several major challenges to AI integration, including teachers' readiness, limited AI literacy, constraints in educational policies, and concerns regarding the ethical use of technology. Similarly, Jacqueline (2024) emphasised that disparities in access to technology and unequal opportunities for AI utilisation among students may also undermine the effectiveness of its implementation. Alblooshi (2025) further identified academic integrity, the accuracy of AI-generated information, and data privacy protection as increasingly significant challenges within digital learning environments. In addition, Alshammari (2026) reported that algorithmic bias and the insufficient preparedness of educators remain major barriers to the comprehensive integration of AI in education. Therefore, the challenges associated with integrating AI into teaching and learning warrant thorough examination to ensure that the implementation of this technology not only supports educational transformation but also upholds the quality, ethical standards, and effectiveness of future learning.

The primary issue concerning the integration of AI in Islamic Education is the lack of AI-based digital learning materials specifically developed to meet the curriculum requirements, pedagogical approaches, and core values of Islamic Education. Although the adoption of AI in education has grown rapidly, most existing digital resources remain generic and pay insufficient attention to the authenticity of Islamic sources, the appropriateness of religious content, and instructional approaches that emphasise the cultivation of *adab* (Islamic manners) and the internalisation of Islamic values. Consequently, Islamic Education teachers continue to rely heavily on conventional teaching materials or are required to adapt existing digital resources before incorporating them into teaching and learning (T&L) activities.

Moreover, the limited availability of AI-based digital learning materials specifically designed for subjects such as the Qur'an, *tajwid*, *hadith*, *aqidah*, and *ibadah* further constrains the implementation of more interactive, adaptive, and personalised learning experiences tailored to students' individual learning needs. Zuhriyeh, Ali, and Hidayat (2025) reported that a significant gap remains in the development of AI-based instructional modules for Islamic Education, as previous studies have predominantly focused on the general application of educational technologies rather than the development of AI-driven learning materials that genuinely address the specific requirements of religious education. The study further emphasised that the development of AI-based learning materials for Islamic Education should maintain an appropriate balance between technological innovation and the preservation of the fundamental values and principles of Islamic Education.

In addition, the development of AI-based digital learning materials requires interdisciplinary expertise in technology, pedagogy, and *Shariah*, which remains limited in many educational institutions. Rosmaini (2025) found that the transformation of Islamic Education through AI continues to face several challenges, including teachers' limited digital competencies, insufficient curriculum readiness, and inadequate technological infrastructure, all of which hinder the development of high-quality digital learning materials. Furthermore, studies examining the future of Islamic Education in the AI era have reported that teachers' limited technological skills, coupled with inadequate digital facilities, are among the key factors slowing the development and implementation of AI-based learning materials in Islamic Education.

Given the limited availability of AI-based digital learning materials in Islamic Education, the development of this conceptual paper is considered essential for providing a more comprehensive understanding of the challenges associated with AI integration and for exploring the actual requirements for its implementation in teaching and learning (T&L). Although AI has attracted increasing attention in the field of education, most previous studies have primarily focused on its potential, benefits, and general applications, while research addressing the specific needs of Islamic Education remains limited. This situation has created a significant knowledge gap regarding how AI can be effectively integrated into Islamic Education without compromising its fundamental principles, including the authenticity of knowledge, the cultivation of *adab* (Islamic manners), moral development, and the continuous guidance provided by teachers.

Furthermore, the limited availability of AI-based digital learning materials specifically developed for Islamic Education has resulted in teachers continuing to rely on generic instructional resources that do not adequately address subject-specific content, such as the Qur'an, *tajwid*, *hadith*, *ibadah*, and *aqidah*. Zuhriyeh, Ali, and Hidayat (2025) reported that the development of AI-based instructional modules for Islamic Education is still at an early stage and requires a more systematic development framework to ensure that the resulting content is not only technologically functional but also aligned with the values and educational philosophy of Islamic Education. These findings highlight the need to establish a clear conceptual foundation before AI-based digital learning materials can be developed and implemented on a broader scale.

Furthermore, Rosmaini (2025) found that the transformation of Islamic Education in the AI era continues to face several major constraints, including teachers' limited digital competencies, inadequate technological infrastructure, and the shortage of digital learning materials tailored to the context of religious education. These challenges imply that the implementation of AI should not be confined to the mere adoption of technological applications; rather, it must be supported by sound pedagogical planning, systematic content development, and users' readiness to effectively utilise AI technologies. In this context, the present conceptual paper serves as a foundational reference that synthesises the key issues, challenges, implementation requirements, and proposed strategies to support the development of more relevant, sustainable, and contextually appropriate teaching and learning (T&L) materials for Islamic Education.

In addition, UNESCO (2023) emphasised that the integration of AI in education requires well-defined policies, guidelines, and implementation frameworks to ensure that the technology is utilised responsibly and equitably for the benefit of all learners. Therefore, the development of this conceptual paper is significant, as it provides an initial reference for formulating an AI integration framework that is appropriate to the context of Islamic Education. Furthermore, it supports the national agenda for digital education transformation by promoting teaching and learning practices that are of higher quality, ethically grounded, and centred on holistic human development.

Based on the limited availability of AI-based digital learning materials in Islamic Education, several research gaps justify the development of this conceptual paper. In general, previous studies on AI in education have predominantly focused on general education, the effectiveness of AI technologies, and the development of AI applications, whereas research examining AI within the specific context of Islamic Education remains limited and insufficiently explored.

The first gap is the **topical gap**. Existing studies have extensively discussed the application of AI in education, including adaptive learning, automated assessment, and generative AI technologies. However, there is a paucity of research investigating the development of AI-based digital learning materials specifically designed for Islamic Education, particularly in subject areas such as the Qur'an, *tajwid*, *hadith*, *aqidah*, and *ibadah*. Moreover, previous studies have paid limited attention to how the distinctive pedagogical characteristics of Islamic Education—such as *talaqqi* (direct teacher–student transmission), the cultivation of *adab* (Islamic manners), the authenticity of religious sources, and the internalisation of Islamic values—can be effectively incorporated into the development of AI-based learning materials. Therefore, this conceptual paper seeks to address this gap by providing a more focused examination of the challenges and requirements for integrating AI within the context of Islamic Education.

Second, there is a methodological gap. Most previous studies have focused on survey-based approaches, conceptual studies, and evaluations of the effectiveness of artificial intelligence (AI) in education. However, studies that explore, in depth, expert perspectives and the actual needs of Islamic Education teachers regarding the development of AI-based digital learning materials remain limited. Therefore, this study adopts a document analysis approach based on a review of relevant literature to obtain a deeper understanding of these needs, which will serve as the foundation for developing a digital module that is appropriate to the context of Islamic Education. Furthermore, there is a lack of studies employing exploratory approaches, such as in-depth interviews, to identify the essential elements required for the development of digital learning materials for Islamic Education. Current research also indicates that AI-related studies in education have predominantly focused on technological design rather than on pedagogical integration and the needs of educators.

Furthermore, there is a scarcity of studies employing exploratory approaches, such as in-depth interviews, to identify the essential elements required for the development of digital learning materials in Islamic Education. Current research also indicates that AI studies in education have largely concentrated on technological design and innovation, with

comparatively less attention given to pedagogical integration and the practical needs of educators.

The third gap relates to the **contextual gap**. The majority of AI-related studies have been conducted within the contexts of higher education or general education in other countries, with limited attention given to secondary school settings and the teaching and learning (T&L) practices of Islamic Education. Furthermore, there remains a lack of comprehensive conceptual frameworks that simultaneously integrate teachers' digital competencies, AI literacy, Islamic Education pedagogy, and the development of AI-based digital learning materials.

In response to these gaps, this conceptual paper is proposed to establish a theoretical foundation and an initial conceptual framework for explaining the challenges of AI integration, identifying the requirements for developing AI-based digital learning materials, and providing directions for future research and the development of teaching and learning (T&L) resources that are better aligned with the needs of Islamic Education. In other words, this study goes beyond merely examining the application of AI; it seeks to address existing knowledge gaps by identifying what is required, how AI-based learning materials should be developed, and the extent to which they can be appropriately implemented within the context of Islamic Education.

Accordingly, this conceptual paper is not intended solely to discuss contemporary issues but also to serve as an initial reference document that provides valuable guidance for various stakeholders involved in education, including:

a) Islamic Education Teachers

This conceptual paper assists Islamic Education teachers in understanding the actual challenges associated with integrating AI into teaching and learning (T&L) while enhancing their awareness of the importance of digital competence and AI literacy. Furthermore, the findings and recommendations presented in this paper may serve as practical guidelines for selecting, evaluating, and utilising AI technologies in an ethical manner that aligns with the objectives of Islamic Education and addresses students' learning needs.

b) Researchers and Postgraduate Students

This conceptual paper provides a theoretical foundation and an initial point of reference for future research on AI in Islamic Education. It also contributes to identifying existing research gaps, proposing more focused research directions, and facilitating the development of AI-based models, instructional modules, and digital learning materials in future studies.

c) Developers of Digital Learning Materials and Educational Technology

This paper offers valuable insights into the actual needs of end users, particularly Islamic Education teachers and students. Such insights are essential to ensure that the development of AI-based applications and digital learning materials extends beyond technological innovation by incorporating sound pedagogical principles, the authenticity of Islamic content, and the values and ethics that underpin Islamic learning.

d) School Administrators and Educational Policymakers

This paper may serve as a reference for planning teachers' professional development programmes, strengthening digital infrastructure, and formulating guidelines for the responsible use of AI in education. The information presented may also support informed decision-making regarding the implementation of a more systematic and sustainable digital education transformation.

e) Students and the Educational Community

Indirectly, students will benefit from more interactive, relevant, and secure learning experiences facilitated by AI. At the same time, the implementation of AI can be appropriately managed to ensure that it does not undermine the cultivation of moral values (*akhlaq*), *adab* (Islamic manners), and the meaningful acquisition of knowledge, which constitute the core principles of Islamic Education. Overall, the primary contribution of this conceptual paper is to provide a comprehensive understanding of the challenges of AI integration, establish a foundational reference for the development of AI-based digital learning materials in Islamic Education, and support the implementation of a more ethical, high-quality, and holistic approach to digital education centred on human development.

Accordingly, this study aims to explore the use of Artificial Intelligence (AI) in digital teaching and learning (T&L) within Islamic Education, which has continued to evolve alongside the digital transformation of twenty-first-century education. Advances in AI technologies have brought significant changes to the delivery of knowledge, access to learning resources, as well as the processes of assessment and learning management. Furthermore, this study seeks to identify the various forms of AI application in digital teaching and learning within the context of Islamic Education. Specifically, it examines a range of AI applications and technologies employed in T&L, including educational chatbots, intelligent tutoring systems, adaptive learning platforms, generative AI tools such as ChatGPT and Gemini, speech recognition applications for Qur'an and *tajwid* learning, as well as virtual reality (VR) and interactive simulation technologies. Identifying these forms of AI application is essential for understanding how AI can be effectively leveraged to enhance the delivery of knowledge, diversify instructional strategies, and create more engaging, personalised, and student-centred learning experiences.

Furthermore, this study aims to explore the challenges associated with the use of Artificial Intelligence (AI) in Islamic Education. Although AI offers numerous benefits, its implementation is accompanied by several challenges and constraints, including varying levels of teachers' digital literacy, limited technological infrastructure, unequal access to the internet, concerns regarding the accuracy and authenticity of AI-generated content, as well as ethical and data security issues. Within the context of Islamic Education, more specific challenges include ensuring that AI-generated content is consistent with the principles of *Shariah*, accurately reflects Islamic rulings (*ahkam*), and maintains the authenticity of Qur'anic recitation and *tajwid*. Therefore, identifying these challenges is essential for developing strategies and guidelines that support the ethical, responsible, and effective integration of AI into Islamic Education.

Overall, this study is expected to provide a comprehensive understanding of the forms of AI application and the challenges associated with its integration into digital teaching and

learning (T&L) in Islamic Education. The findings are anticipated to serve as a valuable reference for Islamic Education teachers, educational administrators, researchers, and policymakers in planning and strengthening the systematic and ethical integration of AI to enhance the quality of Islamic Education in the future.

Definition of Artificial Intelligence (AI)

Literally, the term Artificial Intelligence (AI) is derived from the combination of two words: *artificial*, meaning human-made or artificially created, and *intelligence*, referring to the ability to think, understand, learn, make decisions, and solve problems. Thus, AI can be defined as a technology or computer system designed to emulate human intellectual capabilities in performing specific tasks autonomously. According to Russell and Norvig (2021), AI is defined as a field of study concerned with the development of systems capable of acting rationally through learning, reasoning, and information processing. In the contemporary context, AI encompasses a range of technologies, including **machine learning**, **natural language processing (NLP)**, data analytics, and automated content generation, which are widely applied across various domains, including education.

In the field of education, AI refers to the application of intelligent technologies to support teaching and learning (T&L) by providing personalised learning content, immediate feedback, automated assessment, and more flexible learning experiences. UNESCO (2023) emphasises that AI has the potential to enhance access to education, strengthen student engagement, and assist teachers in managing teaching and learning processes more efficiently.

Overall, the use of Artificial Intelligence (AI) in Islamic Education represents a significant advancement with the potential to strengthen the transformation of teaching and learning (T&L) towards more innovative, interactive, and relevant educational practices that meet the demands of twenty-first-century education. The integration of AI can support teachers in developing more engaging instructional materials, providing personalised learning experiences, and expanding students' access to knowledge through more flexible and accessible learning resources. Nevertheless, the implementation of AI in Islamic Education should not be viewed solely from the perspective of technological advancement, as the ultimate objective of Islamic Education is the holistic development of individuals encompassing intellectual, spiritual, emotional, and moral dimensions.

Therefore, AI should be implemented in an ethical and responsible manner by ensuring the authenticity of Islamic content, preserving the teacher's role as a *murabbi* (educator and moral guide), upholding *adab* (Islamic manners and ethics) in the pursuit of knowledge, and avoiding excessive dependence on technology. In this context, AI should function as a complementary tool that supports the educational process rather than replacing the teacher–student relationship, which is fundamentally grounded in guidance (*irshad*), nurturing (*tarbiyah*), and character development. With systematic planning and the enhancement of teachers' digital competencies, AI has the potential to become a catalyst for the development of a more sustainable, high-quality, and future-oriented digital Islamic Education system.

The Use of Artificial Intelligence in Education

The use of Artificial Intelligence (AI) in education has expanded rapidly in line with advances in digital technology and the Fourth Industrial Revolution (Industry 4.0). AI refers to the

capability of computer systems to perform tasks that typically require human intelligence, such as decision-making, problem-solving, pattern recognition, and the automatic generation of information. Within the educational context, AI is applied through various technologies, including adaptive learning systems, Intelligent Tutoring Systems (ITS), educational chatbots, learning analytics, and generative AI applications such as ChatGPT and Gemini. These technologies enable more personalised learning experiences by accommodating students' abilities, interests, and individual learning needs (Holmes et al., 2022).

According to Zawacki-Richter et al. (2019), the application of AI in education primarily focuses on personalised learning, pedagogical support, automated assessment, and learning data management. Through the use of intelligent algorithms, AI can analyse students' learning performance in real time and recommend appropriate learning activities and instructional resources accordingly. This capability enables students to receive immediate feedback, enhances learning motivation, and promotes more effective self-directed learning. At the same time, AI allows teachers to identify students' learning difficulties and individual needs more efficiently, thereby facilitating the design and implementation of more targeted instructional interventions (Luckin et al., 2016).

The rapid advancement of generative AI in recent years has also created new opportunities in the field of education. Applications such as ChatGPT, Gemini, and Copilot are capable of assisting teachers in developing lesson plans, designing assessment items, producing digital learning materials, and preparing learning activities tailored to students' proficiency levels. For students, generative AI functions as a learning assistant by explaining concepts, answering questions, and providing interactive learning exercises. Nevertheless, the use of these technologies requires appropriate teacher supervision to ensure the accuracy of AI-generated information and to prevent excessive dependence on technology (UNESCO, 2023).

In the context of Islamic Education, AI has considerable potential to enhance teaching and learning (T&L) by making instructional practices more interactive and effective. AI technologies have been incorporated into Qur'an learning applications that utilise speech recognition to evaluate the accuracy of Qur'anic recitation, *makhraj* (articulation points of Arabic letters), and *tajwid* rules. In addition, AI has been employed in the development of intelligent *hifz* (Qur'an memorisation) applications capable of monitoring students' memorisation progress and providing automated feedback. The integration of interactive audio, Islamic educational chatbots, intelligent instructional videos, and Virtual Reality (VR) technologies also enables students to gain a deeper and more engaging understanding of Islamic worship (*ibadah*), *sirah* (the Prophet's biography), and Islamic history (Alam, 2024).

Overall, the application of Artificial Intelligence (AI) in education not only enhances the effectiveness of teaching and learning (T&L) processes but also has the potential to foster more flexible, inclusive, and student-centred learning environments. Within the context of Islamic Education, the integration of AI can strengthen students' acquisition of knowledge, skills, and appreciation of Islamic teachings while supporting the evolving demands of contemporary digital education. Nevertheless, the implementation of AI must be guided by ethical principles and aligned with the principles of *Shariah* to ensure that the technology is utilised responsibly and delivers optimal educational benefits for both teachers and students.

The Importance of Teaching and Learning Using Artificial Intelligence

The application of Artificial Intelligence (AI) in education has brought numerous benefits to teachers, students, and the education system as a whole. AI has the potential to enhance the effectiveness of teaching and learning (T&L) by providing more interactive, flexible, and student-centred learning experiences. In line with the ongoing digital transformation of twenty-first-century education, AI is increasingly recognised as an innovative technology capable of supporting efforts to improve educational quality while addressing the diverse learning needs of students.

From a teaching perspective, AI assists teachers in developing more creative, engaging, and learner-centred instructional materials. Generative AI applications such as ChatGPT, Gemini, and Copilot enable teachers to generate lesson plans, assessment items, interactive quizzes, digital learning resources, and learning activities more efficiently and systematically. The use of these technologies reduces the time required for instructional preparation, allowing teachers to devote greater attention to pedagogical practices, student guidance, and the holistic development of learners (UNESCO, 2023). In addition, AI enables teachers to diversify their instructional approaches through the integration of interactive videos, virtual simulations, educational games, and intelligent learning platforms, thereby enhancing student engagement and participation in the classroom.

From the students' perspective, AI provides opportunities for more personalised learning by accommodating individual abilities, learning preferences, and educational needs. AI-powered adaptive learning systems are capable of tailoring instructional content based on students' learning performance while providing immediate feedback on completed tasks. This enables students to identify their learning difficulties more quickly and continuously improve their mastery of specific topics. Furthermore, AI promotes self-directed learning by allowing students to access learning resources anytime and anywhere without relying entirely on teachers (Holmes and Tuomi, 2022).

In the context of Islamic Education, AI has considerable potential to enhance the learning of the Qur'an, *tajwid*, *hifz* (Qur'an memorisation), and *ibadah* (acts of worship) through the use of speech recognition applications, interactive audio, and intelligent tutoring systems. For example, AI applications equipped with speech recognition technology can assist students in identifying errors in Qur'anic recitation while providing immediate feedback on the correct *makhraj* (articulation points of Arabic letters) and *tajwid* rules. This technology enables students to practise repeatedly and consistently, thereby improving their mastery of Qur'anic recitation. In addition, the use of Virtual Reality (VR) and digital simulations can help students develop a clearer and more meaningful understanding of acts of worship, such as *Hajj*, *Umrah*, and *Salah* (prayer).

From an educational management perspective, AI contributes to reducing teachers' workload, particularly in the areas of assessment, report preparation, and student performance analysis. AI systems are capable of automatically analysing learning data and generating accurate reports within a relatively short period. This capability enables teachers to identify students' achievement levels more efficiently and to design more targeted and effective follow-up interventions. At the same time, the integration of AI enhances teachers' productivity and efficiency in managing teaching, learning, and digital assessment processes.

Overall, the application of AI in education offers substantial benefits to both teachers and students by improving the effectiveness of teaching and learning (T&L), fostering self-directed learning, reducing teachers' administrative workload, and creating more engaging and meaningful learning experiences. Within the context of Islamic Education, the integration of AI has the potential to strengthen students' acquisition of knowledge and skills through the use of innovative educational technologies. Nevertheless, the implementation of AI should be guided by ethical principles, moral values, and continuous teacher supervision to ensure that its benefits are maximised without compromising the fundamental objectives of education.

Forms of AI Applications in Islamic Education

Within the context of Islamic Education, Artificial Intelligence (AI) can be integrated through various forms of digital media to support more interactive, meaningful, and student-centred teaching and learning (T&L). The major forms of AI application include the following:

a) AI-Based Audio

AI-based audio technologies are employed to support learning activities that involve listening comprehension, pronunciation, and the internalisation of knowledge. In Islamic Education, these technologies can be applied through digital Qur'anic recitation, interactive *tajwid* exercises, *makhraj* (articulation points of Arabic letters) recognition, and automated feedback systems that evaluate students' recitation. AI can also generate synthetic voice recordings, convert text into speech (text-to-speech), and enable students to practise recitation repeatedly at their own pace. For example, students can listen to Qur'anic verses, supplications (*du'a*), or *hadith* recited with accurate pronunciation, thereby enhancing both comprehension and memorisation.

b) AI-Based Visuals

AI-based visual applications involve the presentation of information through images, graphics, animations, and infographics that are generated or enhanced using AI technologies. In Islamic Education, visual resources can be used to explain abstract concepts such as the Articles of Faith (*Arkan al-Iman*), the *Sirah* (biography of the Prophet Muhammad SAW), the rituals of *Hajj*, the structure and themes of Qur'anic verses, and mind maps illustrating *tajwid* rules. The integration of visual elements enhances students' attention, comprehension, and knowledge retention by making learning more engaging and accessible.

c) AI-Based Video

AI also plays a significant role in the automatic generation of interactive instructional videos. In Islamic Education, AI-generated videos can be utilised to demonstrate the proper performance of acts of worship such as *wudu'* (ablution) and *salah* (prayer), simulate historical events in Islamic civilisation, explain *fiqh* rulings, and facilitate story-based learning (*storytelling*). AI enables these videos to be adapted to students' learning needs through features such as automatic subtitles, multilingual translation, AI-generated instructional avatars, and dynamic content delivery.

d) AI-Based Virtual Reality (VR) Simulation

Virtual Reality (VR) represents one of the most promising AI-supported technologies for Islamic Education, as it enables immersive learning experiences. Through VR simulations,

students can virtually experience the rituals of *Hajj* and *Umrah*, visit significant Islamic historical sites such as Makkah and Madinah, explore the journey of the Prophet Muhammad's (SAW) *Hijrah*, and learn the practical implementation of Islamic acts of worship within a three-dimensional environment. This immersive approach helps students develop more concrete learning experiences, enhances their appreciation and understanding of Islamic teachings, and effectively bridges the gap between theoretical knowledge and practical application.

In the field of *tajwid*, AI serves as a complementary instructional tool that supports students in understanding and mastering the rules of Qur'anic recitation in a more interactive, systematic, and personalised manner. AI can be integrated through the combined use of audio, visual, video, and digital simulation technologies, enabling students not only to observe but also to listen to and repeatedly practise Qur'anic recitation. From an audio perspective, AI technologies such as speech recognition assist students in identifying recitation errors and provide immediate feedback on pronunciation, vowel prolongation (*madd*), nasalisation (*ghunnah*), and specific *tajwid* rules. From a visual perspective, AI facilitates the presentation of *tajwid* rules through colour coding, graphical representations, and automatic annotation of Qur'anic text, thereby enabling students to recognise recitation patterns more effectively.

Furthermore, AI-based instructional videos provide clear and engaging step-by-step demonstrations of Qur'anic recitation techniques and the practical application of *tajwid* rules. In addition, digital simulations, including three-dimensional animations and Virtual Reality (VR), enable students to visualise the *makhraj* (articulation points of Arabic letters) and the movements of the speech organs involved in Qur'anic recitation. This approach enhances students' conceptual understanding of *tajwid*, shifting the learning process from mere memorisation of rules to a more meaningful experience through listening, observation, and practical application. Nevertheless, the use of AI in *tajwid* instruction should be regarded as a complementary educational tool that supports the traditional methods of *talaqqi* (direct transmission from teacher to student) and *musyafahah* (face-to-face oral recitation), as accurate Qur'anic recitation ultimately requires direct guidance, supervision, and verification by a qualified teacher.

Challenges of AI Integration in Education

A review of the literature indicates that the application of Artificial Intelligence (AI) in education has expanded considerably due to its ability to support more adaptive, flexible, and student-centred learning experiences. Nevertheless, its implementation continues to face numerous challenges related to pedagogy, ethics, users' competencies, and the development of digital learning materials. Ng, Chan, and Lo (2025) identified several key challenges associated with AI implementation in education, including limited AI literacy, teachers' readiness, the absence of comprehensive implementation guidelines, and disparities in digital competencies, all of which may undermine the effective integration of AI technologies in classroom instruction. Furthermore, the increasing use of generative AI has raised concerns regarding the accuracy of AI-generated information, academic integrity, data privacy, and excessive reliance on technology, particularly when users lack the critical skills required to evaluate AI-generated content (Asmawi & Nasri, 2026).

Within the context of Islamic Education, the integration of Artificial Intelligence (AI) presents more complex challenges than those encountered in other educational disciplines. This is because the objectives of Islamic Education extend beyond the transmission of knowledge to encompass the cultivation of *adab* (Islamic manners), moral character (*akhlaq*), the internalisation of Islamic values, and the preservation of the authenticity of religious knowledge. Accordingly, the integration of AI into the teaching and learning (T&L) of Islamic Education must be implemented ethically, guided by the principles of *Shariah*, and carried out with due consideration of the teacher's role as a *murabbi* (educator and moral guide). Such an approach ensures that AI functions as a supportive educational tool that facilitates the process of *tarbiyah* (holistic Islamic nurturing) without compromising the objectives and philosophy of Islamic Education (Khoiruddin et al., 2026; Taha, 2025).

Furthermore, recent studies indicate that the development of AI-based digital learning materials for Islamic Education remains at an early stage. Most previous research has primarily focused on conceptual discussions, proposed frameworks, or prototype development, whereas empirical studies that specifically develop AI-based digital learning materials aligned with the curriculum requirements of Islamic Education remain scarce. This highlights a significant research gap in the development of AI-powered digital resources that adequately address the specific needs of teaching and learning in Islamic Education. Consequently, there is an urgent need to develop more systematic, contextually relevant, and curriculum-aligned AI-based digital learning materials to support effective instructional practices (Zuhriyeh et al., 2025).

In addition, the level of acceptance and readiness among Islamic Education teachers (IETs) regarding the use of Artificial Intelligence (AI) remains inconsistent due to constraints related to technological knowledge, AI literacy, the ability to select and critically evaluate AI-generated content, and their understanding of how AI can be pedagogically integrated into teaching and learning (T&L) practices (Hamzah & Zulkifli, 2025; Li et al., 2026; Almajdoub et al., 2026).

More specifically, in the field of *tajwid*, the application of AI presents additional challenges related to the accuracy of Qur'anic recitation and the preservation of traditional methods of Qur'an instruction, particularly *talaqqi* (direct teacher–student transmission) and *musyafahah* (face-to-face oral recitation). Although AI technologies such as speech recognition, intelligent audio systems, and *tajwid* rule detection applications have considerable potential to assist students in automatically identifying recitation errors, concerns remain regarding the accuracy of these systems in evaluating *makhraj* (articulation points of Arabic letters), *sifat al-huruf* (phonetic characteristics of Arabic letters), and the application of *tajwid* rules, all of which require human verification by qualified teachers. Recent studies have shown that AI technologies are capable of achieving high levels of accuracy in detecting *tajwid* rules; however, their effectiveness continues to depend on the quality of training data, linguistic context, and teacher validation. At the same time, users have expressed concerns that AI may be perceived as a substitute for teachers, despite the fact that Qur'anic learning fundamentally requires direct guidance, supervision, and the cultivation of proper *adab* (Islamic manners and etiquette) in recitation—elements that cannot be fully replaced by technology.

Therefore, the challenges associated with the use of AI in Islamic Education, particularly in the field of *tajwid*, highlight the need for a balanced and well-structured approach to technology integration. Such an approach should prioritise the development of high-quality AI-based digital learning materials, the enhancement of Islamic Education teachers' digital competencies, and the establishment of rigorous content validation mechanisms to ensure the accuracy and authenticity of Islamic knowledge. At the same time, it is essential to preserve the integrity of established Qur'anic teaching methodologies, particularly *talaqqi* (direct teacher–student transmission) and *musyafahah* (face-to-face oral recitation), so that AI serves as a complementary educational tool rather than a replacement for the indispensable role of qualified teachers in Qur'anic instruction.

AI Applications in the Teaching and Learning of Islamic Education

Artificial Intelligence (AI) applications in the teaching and learning (T&L) of Islamic Education can be systematically integrated through a variety of activities that promote active, interactive, and student-centred learning. Based on a sample Daily Lesson Plan (DLP) for the Form Two topic *Rules of Nun Sakinah and Tanwin*, AI is utilised as an instructional support tool to enhance students' understanding of *tajwid* rules through the use of platforms such as ChatGPT, Gemini, AI Voice Quran, Canva AI, and Quizizz AI. During the lesson induction, AI is employed to present videos of Qur'anic recitation and to generate thought-provoking questions that stimulate students' interest in learning *tajwid*. During the concept exploration phase, students use AI applications to obtain explanations of the rules of *Nun Sakinah* and *Tanwin* in the form of easily understandable tables before comparing the AI-generated information with the teacher's explanations.

During collaborative group activities, AI assists students in identifying Qur'anic verses that demonstrate the rules of *Izhar*, *Idgham*, *Iqlab*, and *Ikhfa'*. Students subsequently use Canva AI to create digital infographics that reinforce their understanding of these *tajwid* rules. For reinforcement and assessment purposes, students utilise AI to identify *tajwid* rules in selected Qur'anic verses and independently verify their answers through digital assessment platforms such as Google Forms AI and Quizizz AI. The integration of AI into the teaching and learning process not only enhances students' mastery of *tajwid* but also promotes self-directed learning, critical thinking, collaboration, and digital literacy. Nevertheless, the use of AI should always be accompanied by appropriate teacher guidance to ensure the accuracy of information and the authenticity of religious content, in accordance with the principles and educational philosophy of Islamic Education.

Table 1

Sample Daily Lesson Plan Integrating Artificial Intelligence (AI) in the Teaching and Learning of Tajwid (Form Two)

Subject	: Islamic Education
Grade/Form	: Form Two
Learning Area	: Qur'an / <i>Tajwid</i>
Topic	: Rules of <i>Nun Sakinah</i> and <i>Tanwin</i>
Duration	: 60 minutes
Number of Students	: 30

Content Standard	1.3 Recite Qur'anic verses by applying the correct <i>tajwid</i> rules.
Learning Standards	1.3.1 Identify the rules of <i>Nun Sakinah</i> and <i>Tanwin</i> . 1.3.2 Recite Qur'anic verses by correctly applying the relevant <i>tajwid</i> rules.
Learning Objectives	By the end of the lesson, students will be able to: 1. Identify at least four rules of <i>Nun Sakinah</i> and <i>Tanwin</i> accurately. 2. Correctly identify at least eight out of ten examples of <i>tajwid</i> rules using AI applications. 3. Recite Qur'anic verses accurately by applying the appropriate <i>tajwid</i> rules.
Success Criteria	Students are considered successful if they are able to: 1. Identify <i>tajwid</i> rules with at least 80% accuracy. 2. Justify the selection of the appropriate <i>tajwid</i> rule. 3. Recite the selected Qur'anic verses correctly.
Teaching and Learning Activities	Lesson Induction (5 minutes) Teacher Activities • The teacher presents an AI-generated Qur'anic recitation video or a recording by a renowned <i>qari</i>. • The teacher asks: <i>"Why does this recitation sound so fluent and melodious?"</i> Student Activities • Watch the video. • Respond based on their observations. AI Integration • ChatGPT or Gemini generates higher-order thinking questions. • AI Voice Quran provides a model of accurate Qur'anic recitation. Step 1: Concept Exploration (15 minutes) Teacher Activities • Students are instructed to access ChatGPT or Gemini. • The teacher provides the following prompt: <i>"Explain the rules of Nun Sakinah and Tanwin in a simple table suitable for Form Two students."</i>

	Student Activities • Obtain information generated by AI. • Compare the AI-generated explanations with the teacher's notes. AI Applications • ChatGPT • Gemini 21st-Century Learning Strategy • Think–Pair–Share Step 2: Collaborative Group Activity (20 minutes) AI-Based Task The teacher instructs students: <i>"Find ten Qur'anic verses that contain the rules of Nun Sakinah and Tanwin."</i> Student Activities • Use AI applications to locate relevant Qur'anic verses. • Classify each example according to the following <i>tajwid</i> rules: ◦ <i>Izhar</i> ◦ <i>Idgham</i> ◦ <i>Iqlab</i> ◦ <i>Ikhfa'</i> Learning Product • Students create a digital infographic using: ◦ Canva AI ◦ Canva Magic Design AI Applications • ChatGPT • Canva AI Step 3: Reinforcement (15 minutes) Teacher Activities • The teacher displays several Qur'anic verses. Student Activities • Students use AI to verify their answers using the following prompt: <i>"Identify the tajwid rules in the following Qur'anic verse and explain your reasoning."</i>
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	Assessment • AI-assisted Google Forms Quiz • Quizizz AI Lesson Closure (5 minutes) Lesson Summary The teacher asks: "<i>What are the advantages of using AI to learn tajwid?</i>" Expected Student Responses • AI provides information quickly. • AI generates numerous learning examples. • AI supports independent learning and practice. Values • Use AI responsibly and ethically. • Verify AI-generated information with the teacher and authentic Islamic sources.
Classroom-Based Assessment (CBA/PBD)	Each student is required to prepare an infographic-style mind map and complete the assigned <i>tajwid</i> exercises.
Reflection	• ___ / 30 students successfully achieved the learning objectives. • Students demonstrated a high level of engagement when using AI during the lesson. Students still require teacher guidance to verify the accuracy of AI-generated responses against authentic Islamic sources and references.

Conclusion

The rapid advancement of Artificial Intelligence (AI) technologies has brought about significant transformations across various sectors, including education. Within the context of Islamic Education, the emergence of diverse AI-based applications and platforms has created new opportunities for implementing teaching and learning (T&L) approaches that are more dynamic, flexible, and responsive to students' diverse learning needs. AI has the potential to enrich learning experiences by providing diverse educational resources, immediate feedback, and personalised learning opportunities. Nevertheless, the extent to which AI is effectively integrated into instructional practices remains influenced by several factors, including teachers' digital competencies, access to technological infrastructure, professional development opportunities, and their readiness to adapt pedagogical practices to contemporary technological advancements.

Furthermore, the integration of AI into Islamic Education requires careful consideration, as the content generated often involves religious knowledge that demands a high degree of accuracy, authenticity, and reliability. Matters relating to *aqidah* (Islamic creed), *ibadah* (acts of worship), *fiqh* (Islamic jurisprudence), and Qur'anic recitation require reference to authentic sources and verification by qualified scholars and educators with relevant expertise. Therefore, AI should not be regarded as a substitute for the role of teachers but rather as a complementary educational tool that enhances the effectiveness of teaching and learning. Previous studies have also shown that the adoption of digital technologies in the teaching of the Qur'an and *tajwid* continues to face several challenges, including the limited availability of appropriate learning materials, disparities in technological literacy, and the continued reliance on traditional pedagogical approaches (Yahaya et al., 2021). These findings indicate that expanding the use of AI in Islamic Education requires systematic planning, continuous professional development, and sustained institutional support.

The integration of Artificial Intelligence (AI) technology into the teaching and learning of Islamic Education has become an imperative to modernise instructional practices by making them more interactive, adaptive, and learner-centred. To extend the findings of this conceptual study, several directions for future research are proposed. First, empirical studies and pilot testing should be conducted to evaluate the effectiveness of specific AI tools, such as speech recognition technology, in teaching the Qur'an and Tajwid to enable students or learners to independently and in real time correct their pronunciation of *makhraj* (points of articulation). Second, further research is recommended to develop an ethical framework and a Shariah-compliant AI validation mechanism involving experts from relevant disciplines to ensure the accuracy, authenticity, and religious compliance of AI-generated Islamic content. Finally, future studies should focus on the development of a specialised digital pedagogical training module for Islamic Education teachers (IETs) to enhance their AI competencies, digital pedagogical skills, and ethical use of AI in alignment with the aspirations of the National Digital Education Policy and the Malaysia Education Blueprint 2026–2035.

Overall, Artificial Intelligence (AI) has significant potential to support the transformation of Islamic Education towards more innovative, interactive, and student-centred teaching and learning. Beyond enhancing the quality of knowledge delivery and instructional management, AI can also promote self-directed learning and strengthen students' mastery of learning content. Nevertheless, the effectiveness of AI implementation depends on achieving an appropriate balance between technological advancement, users' competencies, and adherence to the ethical values and principles of Islamic Education. With the support of national education policies, continuous professional development for teachers, and the integration of AI technologies guided by the principles of *Shariah*, AI has the potential to become a key catalyst for the development of a more effective, relevant, and sustainable Islamic Education system that is well equipped to address future educational challenges, in line with the aspirations of the Digital Education Policy (*Dasar Pendidikan Digital*) and the Malaysia Education Blueprint 2026–2035.

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