

Opportunities and Challenges of Using Artificial Intelligence (AI) in Learning Tahfidz Qur'an

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ABSTRACT

The development of Artificial Intelligence (AI) has significantly transformed the educational sector, including the learning process of Qur'anic memorization (*tahfidz Al-Qur'an*). The integration of AI has introduced more personalized, adaptive, and flexible learning systems through features such as speech recognition, automated assessment, learning performance analysis, and *muraja'ah* reminders. However, the implementation of AI in Islamic education also raises pedagogical, spiritual, and ethical challenges that require further scholarly attention. This study aims to analyze the opportunities and challenges of using Artificial Intelligence (AI) in *tahfidz Al-Qur'an* learning. The research employed a qualitative approach, using library research and content analysis techniques. Data were collected from scholarly articles, academic books, and prior studies on AI, Islamic education, and Qur'anic memorization. The findings reveal that AI significantly improves the effectiveness of *tahfidz* learning through personalized learning systems, flexible access to learning, real-time recitation evaluation, and enhanced *muraja'ah* quality. AI-based applications such as Tarteel, Qara'a, and Ngaji.ai enable learners to memorize the Qur'an more independently and systematically. Nevertheless, the use of AI also has the potential to reduce direct interaction between teachers and students, weaken the spiritual dimension of learning, and create challenges related to digital ethics and technological literacy gaps. This study argues that AI cannot replace teachers' role as spiritual mentors in *Tahfidz Al-Qur'an* education. Therefore, the integration of AI should be guided by humanistic and spiritual approaches to ensure that technology serves as a supportive educational tool without diminishing the essential values of Islamic education.

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INTRODUCTION

The development of digital technology has brought major changes in various sectors of life, including the field of education. One of the most developed innovations in recent years is Artificial Intelligence (AI), which is now beginning to be integrated into modern learning systems (B. Cahyono, 2023; Ridlo et al., 2026). The UNESCO report shows that the use of AI in education continues to increase because it is able to create a more personalized, adaptive, and efficient learning process. Globally, AI technology is used to support learning personalization, evaluation automation, student performance analysis, and the development of data-based learning systems (Choiriyah et al., 2025; Lodge et al., 2024; Muttaqin et al., 2025; Nun et al., 2025; Rahardja, 2022; Syukur et al., 2024). In the Indonesian context, the digital transformation of education has also undergone significant developments, especially after the COVID-19 pandemic, which has accelerated the use of digital platforms in teaching and learning activities. This condition shows that the integration of AI is no longer just an alternative technology, but has become part of a new direction of contemporary education. In Islamic education, the development of AI began to be applied to learning the Qur'an, including the tahfidz learning (Akmansyah et al., 2025; Effendi et al., 2025; Setiawan et al., 2025; Suryana et al., 2024). The learning of tahfidz Al-Qur'an has different characteristics compared to general learning because it not only emphasizes the cognitive aspect in the form of the ability to memorize verses, but also involves the spiritual, emotional, and character formation of students (Alzahrani, 2022; Ismail et al., 2023; Mukhammad & Bon, 2026; Syukri et al., 2025). The tahfidz process requires discipline, consistency of muraja'ah, strengthening motivation, and intensive pedagogical relationships between teachers and students. However, various studies show that tahfidz learning still faces a number of problems, such as weak memorization retention, decreased student motivation, limited guidance time, and differences in individual abilities in the process of memorizing the Qur'an (Ramadhani & Aprison, 2022; Sodik et al., 2024).

At the same time, the development of AI-based applications such as Tarteel, Ngaji.ai, and Qara'a began to offer more flexible tahfidz learning models through voice recognition, automatic evaluation, muraja'ah reminders, and real-time reading feedback. The presence of this technology shows that there are new opportunities to increase the effectiveness of tahfidz learning through a more personalized and adaptive digital approach. The integration of AI in tahfidz learning also raises various pedagogical, spiritual, and ethical problems (Nugraha et al., 2025; Suryana et al., 2024; Turrohma & Prasetya, 2026). It is feared that the excessive use of technology can reduce direct interaction between teachers and students, even though these relationships are an important part of the transmission of spiritual values, the formation of morals, and the internalization of manners in Islamic education (Aryasutha et al., 2025; Aulia et al., 2025; Aziz & Amir, 2025; B. T. Cahyono et al., 2024; Fahrurrozi et al., 2025; Ismawati, 2023; Munawaroh, 2025). In addition, AI has not been able to fully replace the role of teachers in building exemplary, spiritual motivation, and appreciation of Qur'anic values. Other challenges that are also starting to become a concern are the issue of digital ethics, user data security, and the technology literacy gap in the Islamic education environment (Majit Abdul, Haoxing, & System, 2023). Thus, the integration of AI in tahfidz learning is not only related to the effectiveness of technology, but also concerns how to maintain a balance between digital innovation and humanistic values in Islamic education. A number of previous studies have discussed the use of AI in Islamic education. Research (Hafiz et al., 2024) highlights the development of AI-based learning media to increase the effectiveness of Qur'an learning, while Sukmawati (2024) emphasizes learning efficiency through digital technology. On the other hand, the research of Majit and Miski (2023) discusses the shift in religious authority due to the digitization of Qur'an learning. Some of these studies show that AI has great potential in supporting modern Islamic learning. However, most of the research still focuses on the technical aspects and the effectiveness of the use of technology. At

the same time, studies that discuss the integration of AI in tahfidz learning more comprehensively, particularly those that link pedagogical opportunities to spiritual and ethical challenges, are still relatively limited. Thus, there is a research gap in the form of the absence of a balanced study that discusses AI as an educational innovation as well as a challenge to the spiritual and humanistic dimensions in learning tahfidz Al-Qur'an (Hafiz et al., 2024).

Based on these conditions, this article aims to analyze the opportunities and challenges of using Artificial Intelligence (AI) in learning tahfidz Al-Qur'an. This research specifically seeks to explain how AI can support the effectiveness of tahfidz learning through learning personalization, automated evaluation, and flexibility of learning access, as well as identifying various challenges that arise in pedagogical relations, spiritual values, and Islamic educational ethics. This article departs from the assumption that the success of AI integration in tahfidz learning is not only determined by technological sophistication, but also by the ability of Islamic educational institutions to maintain a balance between digital innovation and the central role of teachers as spiritual guides. Through a qualitative approach based on library research with content analysis techniques, this article seeks to prove that AI can be a strategic instrument in increasing the effectiveness of learning tahfidz Al-Qur'an if used proportionately and still placing teachers as the center of students' spiritual development. Thus, this research is expected to enrich the study of contemporary Islamic education regarding the integration of digital technology while making a practical contribution to the development of AI-based tahfidz learning models that remain oriented towards spiritual values, ethics, and character formation.

METHOD

This research method uses a qualitative approach with the type of library research. This approach was chosen because the research focuses on an in-depth study of various scientific literature that discusses the integration of Artificial Intelligence (AI) in the learning of tahfidz Al-Qur'an. A qualitative approach is used to interpretively understand phenomena through the analysis of textual data, thus allowing researchers to comprehensively explore the opportunities and challenges of using AI in the context of contemporary Islamic education. This approach is relevant because the issue of technology integration in tahfidz learning is not only related to technical aspects, but also concerns pedagogical, spiritual, and ethical dimensions that require in-depth interpretation of various academic sources.

This research is descriptive-analytical using *content analysis* techniques. The descriptive approach is used to describe the phenomenon of AI development in Qur'an learning in a systematic manner. In contrast, content analysis is used to identify, classify, and interpret key themes related to the opportunities, challenges, and implications of the use of AI in Qur'an tahfidz learning. Through content analysis, this study not only describes the use of AI technology but also examines the meaning, tendencies, and pedagogical consequences of the integration of such technology in Islamic education. The data sources in this study consist of primary data and secondary data. Primary data is obtained from reputable scientific articles, international journals, and academic works that directly discuss the use of AI in Islamic education and Qur'an learning, such as the works of Gunawan et al. (2023), Sukmawati (2024), and Majit (2022). The selection of primary sources was carried out based on the relevance of the theme, the novelty of the publication, and the relevance to the research focus on the integration of AI in tahfidz learning. Meanwhile, secondary data was obtained from academic books, seminar proceedings, research reports, and other scientific documents that support the study of educational technology, Islamic education, and tahfidz learning the Qur'an.

The data analysis technique uses a *content analysis* model, which is carried out through several stages. First, data reduction is carried out by selecting and focusing on information that is relevant to the research objectives. Second, data categorization is carried out by grouping data

into main themes, such as AI pedagogical opportunities, learning personalization, the effectiveness of digital *muraja'ah*, spiritual challenges, teacher-student relations, and digital ethical issues in Islamic education. Third, data interpretation is carried out by analyzing the relationship between findings based on the perspective of Islamic education and educational technology. At this stage, the researcher interprets how AI contributes to the effectiveness of *tahfidz* learning while identifying the social, pedagogical, and spiritual implications it causes. Fourth, conclusions are drawn inductively to produce a comprehensive understanding of the integration of AI in the learning of *tahfidz* Al-Qur'an. To strengthen the validity of the data, this study applied the source triangulation technique by comparing various literature and research results that are related to the theme. In addition, the researcher also conducts a critical analysis of each source to avoid interpretation bias and ensure the consistency of the research argument. Thus, the results of the study are expected to have an adequate level of credibility and depth of analysis in explaining the phenomenon of AI integration in learning *tahfidz* Al-Qur'an. In this study, Artificial Intelligence (AI) is operationalized as a technology based on an intelligent computing system that is able to support the learning process through automation features, *speech recognition*, digital reading evaluation, learning personalization, and student learning performance analysis. The learning of *tahfidz* Al-Qur'an is operationalized as a process of memorizing, maintaining, repeating (*muraja'ah*), and understanding the memorization of the Qur'an, which is carried out systematically through the guidance of teachers, spiritual habituation, and the use of certain learning media. The operationalization of this concept is used to clarify the limitations of research while facilitating the analysis process of the integration of AI in the learning of *tahfidz* Al-Qur'an.

RESULT AND DISCUSSION

The results of the study show that the development of Artificial Intelligence (AI) has brought a new transformation in the Qur'anic *tahfidz* learning system. AI integration is no longer just understood as the use of digital media in learning, but has developed into an adaptive learning system that is able to adjust the learning process based on students' abilities, memorization patterns, and needs. In the context of Islamic education, the use of AI shows a shift in the *tahfidz* learning model from the conventional pattern that relies entirely on face-to-face interaction to a hybrid learning model that combines teacher mentoring with digital technology. Based on the results of analysis of various literature, AI has the ability to increase the effectiveness of *tahfidz* learning through learning personalization features, automatic evaluation, and continuous monitoring of memorization progress. AI systems work by collecting and analyzing user data, then generating learning recommendations tailored to each learner's abilities. These findings suggest that AI allows the learning process to take place more flexibly and responsively compared to traditional learning models that tend to be uniform.

In practice, the integration of AI in *tahfidz* learning is seen through the use of artificial intelligence-based applications such as Tarteel, Qara'a, and Ngaji.ai. The results of the study show that these applications function not only as an auxiliary medium for reading the Qur'an, but also as learning instruments that are able to help students in the process of memorizing, *muraja'ah*, and evaluating reading independently. The *speech recognition* technology used in the application allows the system to detect errors in *tajweed*, letter pronunciation, and memorization inconsistencies in real-time. The Tarteel application, for example, shows that AI is able to help users maintain memorization consistency through a *muraja'ah* reminder system, tracking memorization progress, and automatic identification of reading errors. The findings of the study show that these features increase the intensity of students' interaction with the memorization of the Qur'an because the learning process can be done at any time without having to wait for a face-to-face session with the teacher. In addition, the personalization system that the app has allows

users to have a learning experience that is more in line with their respective skill levels. This shows that AI contributes to creating a more flexible and adaptive tahfidz learning model.

Meanwhile, the Qara'a application shows a more complex implementation of AI through the use of *machine learning technology* in the reading evaluation process. Based on the results of the analysis, this system is able to provide direct feedback on the user's articulation and tajweed errors through digital voice analysis. The presence of the automatic evaluation feature helps students make independent corrections faster and more efficiently. In a pedagogical context, these findings show that AI is able to accelerate the basic learning process of the Qur'an, especially at the recitation and *tahsin* stages. However, the results of the study also show that the effectiveness of AI in tahfidz learning still has significant limitations. AI is indeed able to help with technical aspects of learning, such as memorization, repetition, reading evaluation, and monitoring learning progress. However, it has not been able to replace the teacher's pedagogical and spiritual functions in its entirety. In tahfidz education, the relationship between teachers and students is not only academic, but also includes the process of transmitting values, forming manners, spiritual motivation, and internalizing Qur'anic morals. AI systems cannot yet replicate these aspects because the technology only works based on data analysis and algorithms, not through emotional approaches and spiritual examples. The findings of the study also show the potential for a shift in authority in Qur'an learning due to the dominance of digital technology. Students' dependence on AI applications has the potential to reduce the intensity of direct interaction with teachers, so that tahfidz learning can be reduced to just a technical activity of memorizing verses. In fact, in the tradition of Islamic education, the success of tahfidz is not only measured by the quantity of memorization, but also by the spiritual quality and implementation of the values of the Qur'an in daily life. In addition, the study found that the integration of AI in tahfidz learning also faces ethical and social challenges. The issue of user data security, inequality of access to technology, and low digital literacy in some Islamic educational institutions are obstacles to the optimal implementation of AI. Not all students have access to digital devices and adequate internet connections, so the use of AI has the potential to create new gaps in technology-based Islamic education. On the other hand, the uncontrolled use of AI can also lead to a tendency for individualism in learning, as learners interact more with digital systems compared to the learning community and teachers.

Based on these findings, this study shows that AI has a great opportunity in supporting the effectiveness of learning tahfidz Al-Qur'an, especially in the aspects of learning flexibility, learning personalization, and efficiency of memorization evaluation. However, AI integration cannot be positioned as a substitute for the role of teachers, but rather as a supporting instrument in the learning process. The success of the implementation of AI in tahfidz education is highly dependent on the ability of Islamic educational institutions to build synergy between technological innovation and humanistic-spiritual approaches. Thus, the results of this study confirm that the integration of AI in the learning of tahfidz Al-Qur'an needs to be developed through a technological paradigm oriented towards strengthening Islamic educational values. AI can be a strategic instrument in modernizing tahfidz learning if it is used proportionately, ethically, and still places teachers as the center of students' spiritual development. Without this balance, the use of AI has the potential to shift the essence of tahfidz education from the process of forming Qur'ani characters to just a digital activity based on memorization targets.

Table 1. Integration of AI Applications in Tahfidz Learning

Application	Main Features	Benefits
Tarteel	Voice recognition and muraja'ah support	Helps maintain memorization consistency
Qara'a	Real-time pronunciation correction	Improves tajweed and makhraj accuracy
Ngaji.ai	Interactive Quran learning system	Supports independent learning

Table 1 above shows various Artificial Intelligence (AI)-based applications that have been integrated in learning tahfidz Al-Qur'an along with their features and benefits. Applications such as Tarteel, Qara'a, and Ngaji.ai show that AI technology is able to support the Qur'an learning process through voice recognition, real-time reading correction, and interactive learning systems. The presence of the application helps students maintain memorization consistency, improve the accuracy of tajweed and makhraj, and encourage independence in learning. Thus, AI integration makes a positive contribution to the effectiveness and flexibility of learning tahfidz Al-Qur'an in the digital era. The added value of AI integration in tahfidz programs comes from its capacity to provide instant, precise, and sustainable evaluative responses. Furthermore, this innovation facilitates learning independence that is in harmony with the rhythm and competence of each individual, which represents a modern, personalization-based education paradigm. However, the presence of AI in the realm of tahfidz does not necessarily eliminate the urgency of educator figures. Interpersonal relationships between teachers and students remain crucial, especially in the transmission of spiritual values, motivational injections, and the internalization of morals. Therefore, AI technology should be placed as a complementary instrument that enriches the learning experience, not as a total substitution for the role of educators.

Improving the quality and effectiveness of tahfidz can be achieved through the use of AI, insofar as this technology is positioned as an irreplaceable supporter of spiritual values and conventional pedagogical methods in the Islamic educational tradition. Although various AI-based applications offer convenience in learning tahfidz, the effectiveness of these technologies still has limitations. AI systems generally focus more on the technical aspects of reading, such as the accuracy of tajweed and makhraj, but are not able to evaluate the spiritual and emotional dimensions of students thoroughly. In addition, dependence on digital systems has the potential to reduce the intensity of educational interaction between teachers and students, which has been the main foundation in the Qur'an learning tradition.

Opportunities and Challenges of Using Artificial Intelligence (AI) in Learning Tahfidz Al-Qur'an

The presence of AI in the realm of Qur'an memorization presents bright prospects in addition to complex challenges. This digital innovation functions as an alternative means to optimize learning efficiency, but its success is highly dependent on the readiness of infrastructure, methods, and human resources. In terms of opportunities, AI allows the creation of personalized learning, given the variation in memorization capacity among students and technology. AI is here to align instructional content and strategies with the specific needs of each person. This intelligent platform has the capability to monitor deposit progress, accurately detect errors, and provide learning directions that are adaptive to their competency level. The opportunity for students to set their study schedules independently without being bound by geographical or time constraints

is an impact of the flexibility of access offered by AI. Learning materials are now available on a variety of digital devices and can be used as needed at any time.

AI also plays a role in improving the accuracy of learning evaluations. Voice recognition technology integrated in the AI system is able to assess aspects of tajweed, makhraj, and fluency of reading quickly and relatively accurately. Errors in the memorization process can be immediately detected and corrected by students thanks to the automatic assessment mechanism provided by the system. Furthermore, AI can serve as an automatic learning companion. Through certain features, this technology is able to help students perform *muraja'ah* consistently, so that the memorization that has been obtained can be well maintained. In addition, student learning performance can be monitored thoroughly through data processed by AI, so that there is a strong information base for teachers to develop more measurable learning methods. Various challenges arise along with the integration of artificial intelligence in the learning process of Tahfidz Al-Qur'an, which need to be addressed carefully. One of them is the potential dependence on technology. Students who rely too much on AI are worried that they will reduce the intensity of direct interaction with teachers, even though these relationships have important value in providing motivation and spiritual guidance.

Table 2. Opportunities and Challenges of AI in Tahfidz Learning

Appearance	Opportunities	Challenges
Learning System	Personalized learning based on student ability	Dependence on digital technology
Accessibility	Flexible access anytime and anywhere	Digital divide and limited infrastructure
Evaluation	Automatic and accurate assessment of tajwid and makhraj	AI cannot assess sincerity and spiritual appreciation
Teacher Role	Assists with the muraja'ah and monitoring process	Reduced direct interaction between the teacher and the student
Data Management	Learning analytics and performance monitoring	Ethical issues and data security concerns

Table 2 shows that the use of Artificial Intelligence (AI) in learning tahfidz Al-Qur'an presents two interrelated sides, namely opportunities and challenges. In terms of opportunities, AI is able to support the creation of more personalized, flexible, and effective learning through automatic evaluation features and analysis of student learning performance. On the other hand, the use of AI also raises a number of challenges, such as potential dependence on technology, limitations in assessing spiritual and affective aspects, and ethical and data security issues. Therefore, the use of AI in tahfidz learning needs to be carried out proportionally while maintaining the central role of teachers in fostering the character and spirituality of students. In terms of assessment quality, although AI is able to evaluate the technical aspects of reading, this technology is not yet fully able to assess non-technical dimensions such as sincerity, seriousness, and appreciation of memorized verses. These aspects are an important part of tahfidz learning that cannot be measured digitally.

Limited infrastructure in a number of regions has an impact on low accessibility and technological literacy at the level of students and educators. This results in the use of AI-based applications being unable to be carried out optimally due to limited facilities and technical

capabilities. The spiritual values and the formation of self-integrity that are an integral part of tahfidz require the emotional involvement of the teacher, which is difficult to replace by machines. Therefore, even though technology has developed, educators are positioned as the main key to achieving overall learning targets. Serious attention needs to be paid to the ethical and data protection aspects of the use of AI. Given that learning patterns and sound recordings are collected during the learning process, responsible management is essential to ensure the security of learners' personal information. Thus, the opportunity to increase the effectiveness of tahfidz through AI needs to be addressed with a balance of moral and educational aspects. The smart technology must continue to function in the corridor of supporting learning operations, while the essence of education involving spiritual guidance remains in the primary control of the teacher.

DISCUSSION

This research shows that the integration of Artificial Intelligence (AI) in the learning of tahfidz Al-Qur'an presents a new transformation in contemporary Islamic educational practices. These findings show that AI is no longer positioned just as a learning aid, but has developed into an adaptive learning system that is able to support the personalization of students' learning processes (Rahardja, 2022). In the context of tahfidz learning, AI's ability to provide automatic evaluation, muraja'ah reminders, memorization performance analysis, and real-time feedback shows that digital technology can increase the effectiveness and efficiency of the Qur'an memorization process. The findings are in line with adaptive learning theory that places technology as an instrument to tailor learning experiences based on individual needs and abilities of learners. From an educational technology perspective, AI integration shows a paradigm shift in learning from conventional models to data-driven learning (*Data-driven learning*). AI systems allow the learning process to take place more flexibly, personally, and responsive to student development. The findings of this study support the view (Prawiratama, 2023), which confirms that AI is capable of creating a more effective education system through personalization of learning and automation of evaluations. In the context of tahfidz Al-Qur'an, this personalization can be seen from the ability of AI applications to adjust memorization targets, detect reading errors, and provide muraja'ah recommendations based on user performance. Thus, AI not only functions as a digital media but also as a learning support system that is able to improve the quality of students' interaction with memorized materials (Ansari et al., 2020; Nun et al., 2025; Rafida et al., 2024; Sodik et al., 2024; Wale, 2024).

In addition, the results of the study also strengthen the findings (Hafiz et al., 2024). Dan Sukmawati (2024) stated that AI is able to improve the efficiency of learning the Qur'an through a more interactive and independent learning approach. The presence of applications such as Tarteel and Qara'a shows that AI technology can expand access to Qur'an learning more flexibly, especially for students who have limited time or access to tahfidz teachers. In the context of today's digital society, the need for a flexible learning system is becoming increasingly important because the learning patterns of the younger generation tend to be integrated with digital technology. Therefore, AI can be understood as a response to changing educational needs in the digital era that demand speed, accessibility, and learning efficiency. However, this study found that the integration of AI in tahfidz learning also presents more complex problems than just the effectiveness of technology (Main, 2024). The findings of the study show that the use of AI has the potential to reduce the intensity of the pedagogical relationship between teachers and students. In the Islamic educational tradition, the relationship between teacher and student not only serves as a transfer of knowledge but also as a process of transmitting values, forming morals, and internalizing spirituality. AI is indeed able to evaluate tajweed and memorization errors technically. However, it has not been able to replace the affective and spiritual dimensions that have been the core of tahfidz education in the Qur'an. These findings show that modern

educational technology theory cannot be fully applied in the context of Islamic education without considering humanistic and spiritual aspects. In tahfidz learning, success is not only measured through the quantity of memorization, but also through the quality of appreciation, manners, and the implementation of the values of the Qur'an in daily life. Therefore, this study shows that the integration of AI in Islamic education requires a more holistic approach, which is an approach that is able to combine technological innovation with spiritual values and Islamic education ethics (Nofrion) (Albert et al., 2025; Uula & Ali, 2025; Wafa et al., 2024; Zuliani, 2024).

On the other hand, the results of the study also show that there is a tendency to shift learning authority due to the dominance of digital technology. Excessive reliance on AI applications can change Tahfidz's learning orientation to be more technical and individualistic. This phenomenon strengthens the arguments of Majit Abdul, Haoxing, and System (2023) regarding the potential shift of religious authority in the era of digitization of Islamic learning. If not controlled proportionally, AI has the potential to reduce the meaning of tahfidz learning to just a target-based memorization activity and digital performance, no longer a comprehensive spiritual development process. In the context of today's AI needs, research findings show that Islamic educational institutions face challenges in building learning models that are able to integrate technological sophistication with humanistic approaches. AI is indeed a necessity in the modern education system because it is able to expand access to learning and increase learning effectiveness. However, the use of AI in Islamic education cannot be equated with the application of technology in general education, because Islamic education has a stronger orientation in character formation and spirituality. As such, AI should be positioned as a learning support instrument, not as a substitute for the role of teachers entirely. Theoretically, this research contributes to the development of contemporary Islamic education studies, especially in the discourse on the integration of digital technology and educational spirituality. This research shows that the discussion of AI in Islamic education is not enough to focus only on aspects of technological innovation and learning effectiveness, but also needs to consider the dimensions of ethics, pedagogical relations, and spiritual values. Thus, this study expands the perspective of AI studies in Islamic education, which has been more dominant in discussing the technical aspects of the use of technology (Agil Alaydrus & Zahra, 2023, 2023; Bukar et al., 2022; Indasari, 2026; Lester et al., 2023). Practically, the results of this study provide implications for Islamic educational institutions, digital application developers, and educators in designing an AI-based tahfidz learning system that maintains a spiritual and humanistic dimension. Islamic educational institutions need to build a hybrid learning model that combines the use of AI with intensive mentoring from tahfidz teachers. Meanwhile, AI application developers need to consider aspects of digital ethics, user data security, and Islamic educational values in the development of artificial intelligence-based learning systems (Fadhila et al., 2023).

This research also has broader implications for the study of educational communication and digital transformation in Muslim societies (Ramadhani & Aprison, 2022). The integration of AI in tahfidz learning shows that the digitalization of Islamic education is not only a technological phenomenon, but also a social and cultural phenomenon that affects the pattern of educational relations, religious authority, and the construction of learning in the digital era. Therefore, the study of AI in Islamic education needs to be developed in a multidisciplinary manner by involving the perspectives of communication, educational technology, Islamic studies, and digital ethics. However, this study still has limitations because it only uses a literature study approach, so it is not able to describe the empirical experience of AI users in tahfidz learning directly (Solihin, 2020). Therefore, further research is recommended to conduct field studies on tahfidz institutions that have implemented AI in the learning process. Future research may also use a mixed methods approach to empirically measure the influence of AI on memorization quality, learning motivation, character formation, and pedagogical relationships between

teachers and students (Arista et al., 2023; Hermawan, 2025; Ikhwan et al., 2025; Zamroni et al., 2025). In addition, advanced research can develop an AI integration model based on Islamic educational values that is more adaptive to the needs of the digital generation without eliminating the spiritual essence of Qur'anic tahfidz learning.

CONCLUSION

This research shows that the integration of Artificial Intelligence (AI) in the learning of tahfidz Al-Qur'an presents opportunities as well as challenges in contemporary Islamic educational practices. The main findings of the study show that AI is able to increase the effectiveness of tahfidz learning through a more personalized, flexible, and adaptive learning system. AI technology allows learners to have a more interactive learning experience through automatic evaluation features, muraja'ah reminders, memorization performance analysis, and real-time reading feedback. The presence of AI-based applications such as Tarteel, Qara'a, and Ngaji.ai shows that digital technology can support the tahfidz learning process more efficiently and is easily accessible to students in various educational contexts. However, the study also found that the use of AI in tahfidz learning cannot be separated from various pedagogical, spiritual, and ethical challenges. Dependence on technology has the potential to reduce the intensity of the relationship between teachers and students, which has been the core in the transmission of spiritual values, the formation of morals, and the internalization of manners in Islamic education. In addition, AI has not been able to replace the role of teachers in building spiritual motivation, for example, and appreciation of Qur'anic values. This study also found other challenges in the form of digital literacy gaps, security of user data, and the potential for a shift in tahfidz learning orientation to be more technical and individualistic.

Scientifically, this research contributes to the development of contemporary Islamic education studies, especially in the discourse of integrating digital technology and Artificial Intelligence in learning the Al-Qur'an. In contrast to previous research that focused more on the effectiveness of technology, this study shows that the discussion of AI in Islamic education needs to be understood more holistically by considering pedagogical, spiritual, and ethical dimensions at the same time. This research also strengthens the argument that AI should be positioned as an instrument to support learning, not as a substitute for the central role of teachers in Islamic education. Thus, this research contributes to expanding the perspective of AI studies in Islamic education, which has tended to be oriented to the technical aspects of the use of technology. Practically, this research provides implications for Islamic educational institutions and educational technology developers to build an AI-based tahfidz learning system that maintains spiritual and humanistic values. Technology-based learning models need to be developed through a hybrid approach that combines the sophistication of AI with intensive assistance from tahfidz teachers so that the learning process does not lose the dimension of character development and spirituality of students. However, this study has limitations because it uses a *library research* approach, so it does not involve field observation or empirical measurement of the implementation of AI in learning Tahfidz Al-Qur'an. This study has also not directly tested the effectiveness of certain AI applications in improving the quality of memorization, learning motivation, and character formation of students. Therefore, further research is recommended to conduct empirical studies through qualitative, quantitative, and *mixed methods* approaches to obtain a more comprehensive picture of the implementation of AI in tahfidz education. In addition, future research also needs to develop an AI integration model based on Islamic educational values that is able to answer the needs of the digital generation without eliminating the spiritual essence in learning the Qur'an.

REFERENCES

- Agil Alaydrus, M. A., & Zahra, A. (2023). Analysis of Variation of Feature Extraction Methods in the Classification of Al-Qur'an Maqam Using Machine Learning. *Journal of Theoretical and Applied Information Technology*, 101(21), 7085–7093.
- Akmansyah, M., Ramadhani, A., & Prawoto, A. (2025). Integrating Spiritual and Pedagogical Strategies in Tahfidz Al-Qur'an Education: A Comparative Study of Two Pesantren in Metro City, Lampung. *Fikroh: Jurnal Pemikiran Dan Pendidikan Islam*, 18(1), 75–86. <https://doi.org/10.37812/fikroh.v18i1.1767>
- Albert, L. S., Allen, D. G., & Harms, P. D. (2025). Ethical approaches to leadership in organizational contexts: An attachment theory perspective. *Human Resource Management Review*, 35(4). <https://doi.org/10.1016/j.hrmr.2025.101099>
- Alzahrani, S. bin G. (2022). Memorizing the Holy Quran and Its Impact on the Language of the Child. *Quranica*, 14(2 Special Issue 9), 66–91.
- Ansari, I., Hafiz, H. A., & Hikmah, N. (2020). 359-Article Text-1916-2-10-20201225 (1). 2(2), 180–194.
- Arista, H., Mariani, A., Sartika, D., & Murni, D. (2023). Gaya Kepemimpinan Kepala Madrasah dalam Pembentukan Karakter Religius Peserta Didik (Input, Proses dan Output). *Kharisma: Jurnal Administrasi Dan Manajemen Pendidikan*, 2(1), 38–52. <https://doi.org/10.59373/kharisma.v2i1.13>
- Aryasutha, R., Kusriani, N. A. R., Ulya, J. N., & Septiani, N. S. (2025). The Teacher Mover's Contribution in Enhancing the Pancasila Student Profile: A Systematic Literature Review on Values Education. *Adiluhung: Journal of Islamic Values and Civilization*, 1(1), 42–63. <https://doi.org/10.59373/adiluhung.v2i1.115>
- Aulia, S. R., Kusriani, N. A. R., & Daud, W. A. A. W. (2025). Digital Divides and Cultural Bridges: Generational Insights into Internet Slang, Identity, and Perceptions within Islamic Civilizational Discourse. *Adiluhung: Journal of Islamic Values and Civilization*, 1(2), 106–116. <https://doi.org/10.59373/xstwfc64>
- Aziz, M. B., & Amir, A. N. (2025). Evaluating Value-Based Vocational Education Using Logic Model: A Qualitative Inquiry in Islamic Higher Education. *Tafkir: Interdisciplinary Journal of Islamic Education*, 6(3), 700–715. <https://doi.org/10.31538/tijie.v6i3.1969>
- Bukar, U. A., Sidi, F., Jabar, M. A., Nor, R. N. H., Abdullah, S., Ishak, I., Alabadla, M., & Alkhalifah, A. (2022). How Advanced Technological Approaches Are Reshaping Sustainable Social Media Crisis Management and Communication: A Systematic Review. *Sustainability*, 14(10), 5854. <https://doi.org/10.3390/su14105854>
- Cahyono, B. (2023). Pemanfaatan aplikasi digital flipbook sebagai media pembelajaran di era teknologi digital. *Jurnal Dharmabakti Nagri*, 1(2), 58–64.
- Cahyono, B. T., Sukmawati, F., Prihatin, R., Santoso, E. B., Suparmi, S., & Juwita, R. (2024). Pemanfaatan Artificial Inteligent Dalam Meningkatkan Kompetensi Pedagogik Guru SD di Surakarta. *Al-Mada: Jurnal Agama, Sosial, Dan Budaya*, 7(2), 334–344.
- Choiriyah, S., Ramadhan, S., Nugroho, A., Pembangunan, H. R. P., & Muharom, F. (2025). Artificial intelligence-driven learning assessment in faculties of education: An exploratory study. *Munaddhomah: Jurnal Manajemen Pendidikan Islam*, 6(3), 482–495. <https://doi.org/10.31538/munaddhomah.v6i3.1937>
- Effendi, A., Hairunnisa, H., & Jamaliah, J. (2025). Analysis of the Integration of Tahfiz Al-Qur'an in the Curriculum: Its Impact on Student Achievement. *At-Tadzkir: Islamic Education Journal*, 4(1), 81–92. <https://doi.org/10.59373/attadzkir.v4i1.135>
- Fadhila, A. R., Husni, A., Aprison, W., Sjech, U., Djamil, M., Bukittinggi, D., Aua, J. G., Putiah, K., Banuhampu, K., Agam, K., & Barat, S. (2023). Implementasi Pembelajaran Tahfidz Al-

- Qur'an dengan Menggunakan Metode Tasmī' di SMP Islam Al-Ishlah Bukittinggi. *Journal on Education*, 05(03), 6758–6767.
- Fahrurrozi, F., Qomar, M., & Sokip, S. (2025). Character Education Based on Islamic Local Wisdom: A Case Study of Aswaja Value Internalization in a Madrasah Aliyah. *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman*, 14(1), 214–226. <https://doi.org/10.54437/urwatulwutsqo.v14i1.2090>
- Hafiz, A., Mu'ti, A., & Amirrachman, A. (2024). Pengembangan Media Pembelajaran Agama Islam Berbasis Kecerdasan Buatan: Perspektif Pendidikan Agama Islam. *Mauriduna: Journal of Islamic Studies*, 5(1), 56–63. <https://doi.org/10.37274/mauriduna.v5i1.1070>
- Hermawan, H. (2025). Parents' Expectations and Their Relevance to the Character Education Program in Pesantren. *Tafkir: Interdisciplinary Journal of Islamic Education*, 6(4), 1118–1136. <https://doi.org/10.31538/tijie.v6i4.2407>
- Ikhwan, A., Anjelita, R., Kartiko, A., Zukhrufin, F. K., & Ikhwan, A. N. (2025). Strengthening Student Character Through Tapak Suci Extracurricular Activities. *Kharisma: Jurnal Administrasi Dan Manajemen Pendidikan*, 4(1), 73–85. <https://doi.org/10.59373/kharisma.v4i1.70>
- Indasari, N. L. (2026). Modelling Acceptance of Artificial Intelligence Technology among Pre-service Teachers in Islamic Higher Education. *At-Tadzkir: Islamic Education Journal*, 5(1), 22–39. <https://doi.org/10.59373/attadzkir.v5i1.241>
- Ismail, S., Mustafa, N. M., Shaharuddin, S. A., Yahaya, M., Razali, K. S., & Sapiuddin, U. U. (2023). Pre-School Qur'an Memorization Digital Application Requirements. *International Journal of Academic Research in Progressive Education and Development*, 12(2), Pages 2768-2779. <https://doi.org/10.6007/IJARPED/v12-i2/18111>
- Ismawati, I. (2023). Nilai-Nilai Pendidikan Karakter Dalam Novel Sang Juara Karya Al Kadri Johan dan Implikasinya Terhadap Pembelajaran Bahasa Indonesia Pada Siswa. *Attaqwa: Jurnal Ilmu Pendidikan Islam*, 19(2), 278–289. <https://doi.org/10.54069/attaqwa.v19i2.633>
- Lester, D., Skulmoski, G. J., Fisher, D. P., Mehrotra, V., Lim, I., Lang, A., & Keogh, J. W. L. (2023). Drivers and barriers to the utilisation of gamification and game-based learning in universities: A systematic review of educators' perspectives. *British Journal of Educational Technology*, 54(6), 1748–1770. <https://doi.org/10.1111/bjet.13311>
- Lodge, J. M., Ellerton, P., Zaphir, L., & Brown, D. (2024). Assessing in the Age of AI: Is Critical Thinking the Answer? In *Artificial Intelligence Applications in K-12*. Routledge.
- Majit Abdul, Haoxing, Z., & System, C. (2023). Pembelajaran Alquran secara digital: Pergeseran Sistem Isnad dan Peneguhan Otoritas Baru. *Jurnal SMaRT*, 09 No. 01.
- Mukhammad, M., & Bon, A. T. B. (2026). The Influence of Qur'an Memorization Learning on the Quality of Students' Qur'an Memorization. *At-Tadzkir: Islamic Education Journal*, 5(1), 40–51. <https://doi.org/10.59373/attadzkir.v5i1.239>
- Munawaroh, M. (2025). Peran Nilai-nilai Islam dalam Membangun Multikulturalisme Perspektif Kontemporer. *Journal of Education and Learning Innovation*, 2(1), 63–81. <https://doi.org/10.59373/jelin.v2i1.124>
- Muttaqin, I., Tuah, D. bin, Zaini, M., Rianawati, R., Zurayah, H., & Suhaimi, S. (2025). Competitive Advantage Management of Madrasah In the Artificial Intelligence Era. *Munaddhomah: Jurnal Manajemen Pendidikan Islam*, 6(4), 661–680. <https://doi.org/10.31538/munaddhomah.v6i4.2292>
- Nugraha, M. A., Kusuma, D. T., & Pamungkas, M. I. (2025). Analysis of the Implementation of the Islamic Boarding School Curriculum in Enhancing Students' Competence in the Tahfidzul Qur'an Program. *Journal of Islamic Education Research*, 6(2), 125–144. <https://doi.org/10.35719/jier.v6i2.472>

- Nun, L. I., Mohtarom, A., Marzuki, A., & Lawal, U. S. (2025). The Integration of Artificial Intelligence as a Teacher's Partner in Islamic Religious Education Learning. *Journal of Islamic Education Research*, 6(2), 145–162. <https://doi.org/10.35719/jier.v6i2.473>
- Prawiratama, R. A. (2023). Design of a Generative AI Image Similarity Test Application and Handmade Images Using Deep Learning Methods. *Telematika*, 20(3), 326. <https://doi.org/10.31315/telematika.v20i3.10096>
- Rafida, T., Suwandi, S., & Ananda, R. (2024). EFL Students' Perception in Indonesia and Taiwan on Using Artificial Intelligence to Enhance Writing Skills. *Jurnal Ilmiah Peuradeun*, 12(3), 987–1016. <https://doi.org/10.26811/peuradeun.v12i3.1520>
- Rahardja, U. (2022). Masalah Etis dalam Penerapan Sistem Kecerdasan Buatan. *Technomedia Journal*, 7(2), 181–188. <https://doi.org/10.33050/tmj.v7i2.1895>
- Ramadhani, W., & Aprison, W. (2022). Urgensi Pembelajaran Tahfidz Al- Qur 'an d i Era 4.0. *JURNAL Pendidikan Tambusai*, 6(2), 13163–13171.
- Ridlo, R. S., Iliasu, F. S., & Ma`rufah, S. (2026). AI-Mediated Critical Thinking: A Double-Edged Sword in Indonesian Higher Education. *Attaqwa: Jurnal Ilmu Pendidikan Islam*, 22(2), 128–138. <https://doi.org/10.54069/attaqwa.v22i2.1155>
- Setiawan, H., Kausar, S., Hakim, M. N., & Husna, F. A. (2025). Integrating Tahfidz Program Management for Comprehensive Student Character Development. *Kharisma: Jurnal Administrasi Dan Manajemen Pendidikan*, 4(1), 44–59. <https://doi.org/10.59373/kharisma.v4i1.63>
- Sodik, M., Nur Syayidah, L., & Fadilah, A. I. (2024). Manajemen Strategi Pembelajaran Tahfidz Al-Qur'an dalam Meningkatkan Kualitas Hafalan Santri di Pondok Pesantren. *Dirasah : Jurnal Studi Ilmu Dan Manajemen Pendidikan Islam*, 7(2), 859–870. <https://doi.org/10.58401/dirasah.v7i2.1364>
- Solihin, R. (2020). Pengembangan Media Pembelajaran Interaktif Tahfidz Al-Quran Di Sekolah Dasar. *Jurnal Asy-Syukriyyah*, 21(02), 154–163. <https://doi.org/10.36769/asy.v21i02.108>
- Suryana, E., Supriadi, U., Fikri, M., Efriani, A., & Langputeh, S. (2024). Exploring Memorization Patterns in the Tahfidz and Tarjamah Qur'an Programs. *Jurnal Pendidikan Islam*, 10(2), 375–386. <https://doi.org/10.15575/jpi.v10i2.29969>
- Syukri, Adawiyah, R., & Ismail. (2025). The Effect of Metaphor-based Instruction on Students' Memory Retention in Islamic Religious Education (IRE) Lectures. *Jurnal Pendidikan Agama Islam*, 22(2), 567–584. <https://doi.org/10.14421/4d5wq980>
- Syukur, F., Maghfurin, A., Marhamah, U., & Jehwae, P. (2024). Integration of Artificial Intelligence in Islamic Higher Education: Comparative Responses between Indonesia and Thailand. *Nazhruna: Jurnal Pendidikan Islam*, 7(3), 531–553. <https://doi.org/10.31538/nzh.v7i3.13>
- Turrohma, B. M., & Prasetya, B. (2026). From Memorization to Transformation: The Role of Tahfidz in Developing Spiritual and Moral Character. *El-Uswah: Journal of Islamic Primary Education*, 1(1), 59–67.
- Utama, Y. P. (2024). Pengaruh Perbedaan Konsentrasi Ekstrak Kecambah Kacang Kedelai (Glycine max) Terhadap Hasil Nata de Coco. *Jurnal Pendidikan Tambusa*, 8(2), 18974–18981.
- Uula, Z. N., & Ali, M. (2025). Model Kepemimpinan Kolaboratif dalam Sekolah Berbasis Nilai Islam. *Attadrib: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 8(1), 316–326. <https://doi.org/10.54069/attadrib.v8i1.895>
- Wafa, A., Madani, M. T., & Subairi, S. (2024). Pendidikan Islam Berwawasan Nilai-nilai Toleransi di Pesantren Nazhatut Thullab. *Academicus: Journal of Teaching and Learning*, 3(1), 8–18. <https://doi.org/10.59373/academicus.v3i1.36>

- Wale, B. D. (2024). Artificial intelligence in education: Effects of using integrative automated writing evaluation programs on honing academic writing instruction. *Cakrawala Pendidikan*, 43(1), 273–287. <https://doi.org/10.21831/cp.v43i1.67715>
- Zamroni, M. A., Fatikh, M. A., & Sholihah, M. (2025). Membangun Karakter Islami Melalui Pendidikan Berbasis Iman: Perspektif Teologis. *Adiluhung: Journal of Islamic Values and Civilization*, 1(1), 64–79. <https://doi.org/10.59373/adiluhung.v2i1.116>
- Zuliani, S. (2024). Transformasi Nilai Moderasi Melalui Seni Lagu Qur'any: Warisan Spiritual KH. M. Qoyim Ya'qub dalam Membentuk Karakter Jamaah Pengajian Kamisan. *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman*, 13(2), 230–241. <https://doi.org/10.54437/urwatulwutsqo.v13i2.1454>