

UTILIZATION OF AI-BASED LEARNING APPLICATIONS IN IMPROVING STUDENTS' RELIGIOUS DIGITAL LITERACY

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Abstract :

This study aims to analyze the utilization of Artificial Intelligence (AI)-based learning applications in enhancing students' religious digital literacy at MA Model Zainul Hasan Genggong. The increasing exposure of students to digital religious content, including information that is inconsistent with Islamic values, has created an urgent need for adaptive and critical digital literacy skills in Islamic education settings. In response, AI-based learning applications are positioned as an innovative pedagogical tool that can support students in accessing, evaluating, and verifying religious information more effectively in the digital era. This research employs a qualitative approach with a case study design to explore the phenomenon in depth within its natural context. Data were collected through observation, in-depth interviews, and documentation involving teachers, students, and school stakeholders. The data were analyzed using thematic analysis to identify patterns related to the use of AI technologies in Islamic learning processes and their impact on students' religious digital literacy. The findings reveal that AI-based learning applications contribute significantly to improving students' engagement in learning, enhancing their ability to access and understand Islamic content, and encouraging more selective attitudes toward digital religious information. AI tools such as adaptive learning systems, educational chatbots, and verified content search applications support personalized learning experiences and help students comprehend complex religious concepts more effectively. However, the study also identifies key challenges, particularly in students' critical literacy skills and teacher's limited digital competencies, which affect the optimal integration of AI in Islamic education. The study concludes that AI-based learning applications play a strategic role in strengthening students' religious digital literacy by promoting more interactive, adaptive, and learner-centered education. Nevertheless, successful implementation requires stronger teacher guidance, improved digital literacy competencies, and institutional support to ensure that AI integration aligns with Islamic educational values and pesantren-based ethical principles.

Keywords: Artificial Intelligence; Digital Religious Literacy; Educational Technology; Islamic Education.

Abstrak :

Penelitian ini bertujuan untuk menganalisis pemanfaatan aplikasi pembelajaran berbasis kecerdasan buatan (Artificial Intelligence/AI) dalam meningkatkan literasi digital keagamaan siswa di MA Model Zainul Hasan Genggong. Latar belakang penelitian ini didasarkan pada meningkatnya paparan siswa terhadap konten keagamaan digital yang beragam, termasuk informasi yang tidak selalu sesuai dengan nilai-nilai Islam, sehingga diperlukan kemampuan literasi digital keagamaan yang kritis, selektif, dan bertanggung jawab. Dalam konteks ini, teknologi AI dipandang sebagai inovasi pedagogis yang mampu membantu siswa dalam mengakses, memahami, dan memverifikasi informasi keagamaan secara lebih efektif. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus. Pengumpulan data dilakukan melalui observasi, wawancara mendalam, dan dokumentasi yang melibatkan guru, siswa, serta pihak pengelola madrasah. Data dianalisis menggunakan

analisis tematik untuk mengidentifikasi pola pemanfaatan AI dalam proses pembelajaran keagamaan serta dampaknya terhadap literasi digital keagamaan siswa. Hasil penelitian menunjukkan bahwa pemanfaatan aplikasi pembelajaran berbasis AI mampu meningkatkan keterlibatan belajar siswa, memperkuat kemampuan akses dan pemahaman materi keagamaan, serta mendorong sikap lebih selektif terhadap informasi keagamaan digital. Teknologi AI seperti sistem pembelajaran adaptif, chatbot edukatif, dan aplikasi pencarian materi terverifikasi mendukung pembelajaran yang lebih personal dan membantu siswa memahami konsep keislaman yang kompleks. Namun demikian, masih ditemukan kendala berupa rendahnya literasi kritis sebagian siswa serta keterbatasan kompetensi digital guru dalam mengoptimalkan pemanfaatan AI. Penelitian ini menyimpulkan bahwa aplikasi pembelajaran berbasis AI memiliki peran strategis dalam meningkatkan literasi digital keagamaan siswa melalui pembelajaran yang lebih interaktif, adaptif, dan berpusat pada peserta didik. Meskipun demikian, keberhasilan implementasinya tetap memerlukan penguatan peran guru, peningkatan literasi digital, serta dukungan kelembagaan agar sejalan dengan nilai-nilai pendidikan Islam dan prinsip etika pesantren.

Kata Kunci: Kecerdasan Buatan; Literasi Digital Keagamaan; Pendidikan Islam; Teknologi Pendidikan.

INTRODUCTION

The development of artificial intelligence (AI) technology in the last decade has brought significant transformation to various sectors, including the education sector (Zuhairi & Iskandar, 2026). The integration of AI in the learning process not only functions as a technical aid, but also as a pedagogical innovation capable of enhancing the effectiveness, efficiency, and personalization of learning (Zain, Muslih, Maulana, Azizah, & Hakiki, 2025). In the context of modern education, the use of AI-based applications has become one of the important strategies to address the challenges of the digital era, particularly in improving students' digital literacy.

Digital literacy is no longer just the ability to use technological devices, but also includes the ability to understand, evaluate, and utilize digital information critically, ethically, and responsibly (Sitorus, Sipahutar, Nasution, Purnama, & Iskandar, 2025). In the context of religious education, digital literacy has a more complex dimension, namely the ability of students to access, understand, and filter religious information distributed in the digital space in order to avoid disinformation, radicalism, or non-credible religious content (Adib, Anwar, & Anggoro, 2026). Therefore, strengthening religious digital literacy has become an urgent need in Islamic educational institutions, including Madrasah Aliyah (MA).

MA Model Zainul Hasan Genggong, as one of the pesantren-based educational institutions that integrates religious and general curricula, is in a strategic position to adapt to developments in digital technology. Amid the rapid flow of religious information on the internet and social media, students are

required to have adequate religious digital literacy skills to be able to filter valid Islamic sources in accordance with the principles of Ahlussunnah wal Jama'ah. However, in practice, various challenges are still encountered, such as the limited optimal use of learning technology, low students' critical abilities in filtering digital information, and the not yet optimal integration of AI-based technology in the religious learning process.

The use of AI-based learning applications offers great opportunities in addressing these problems. AI technology can be used to provide adaptive learning, recommendations for relevant religious materials, educational chatbots based on Islam, and even more directed and verified information search systems (Wahab, Kasmianti, & Hidayat, 2025). Thus, AI not only serves as a learning medium, but also as a facilitator that helps students develop religious digital literacy in a more directed and systematic way.

The development of artificial intelligence (AI) in education has become a major focus in various contemporary studies. AI is seen as capable of transforming the learning process through adaptive systems, personalized materials, as well as improved efficiency in learning evaluation (Agoi, Folaranmi, Oshinowo, Maulana, & Adinugraha, 2026). In addition, systematic studies show that the implementation of AI in higher education and schools is still dominated by technical aspects such as learning analytics, automated assessment, and intelligent tutoring systems (Zuhriyeh, Ali, & Hidayat, 2025). However, these studies tend not to specifically link AI with the context of religious education, particularly in strengthening digital literacy based on Islamic values.

Next, the study (Derlan, Zuhdi, & Mukti, 2026) Regarding digital technology in Islamic education, it shows that digital transformation in madrasahs is still at an early adaptation stage and is more focused on the use of conventional learning media in digital form, rather than on the optimal utilization of AI. This condition also occurs in educational institutions based on pesantren or madrasahs, where the integration of intelligent technology in religious learning is still limited to the use of general applications without a structured AI-based pedagogical design.

Based on the study, there is a significant research gap, namely the lack of a comprehensive integration between the use of AI-based learning applications and the enhancement of students' religious digital literacy, particularly in the context of pesantren-based madrasahs such as MA Model Zainul Hasan Genggong. Moreover, there is still limited research examining how AI can be

utilized not only as a learning aid but also as a medium to strengthen values-, ethics-, and Islam moderation-based religious digital literacy.

The novelty of this research lies in the integration of three main aspects. First, the utilization of AI in religious learning oriented towards enhancing students' religious digital literacy. Second, the research context which focuses on pesantren-based madrasahs that have traditional-modern Islamic educational characteristics. Third, the approach to religious digital literacy that is not only technical but also emphasizes critical, ethical, and verificative aspects in understanding Islamic information in the digital era. Thus, this research is expected to provide theoretical contributions in the development of AI-based learning models in Islamic education, as well as practical contributions in designing strategies to strengthen religious digital literacy that are more adaptive to technological developments.

RESEARCH METHOD

This research uses a qualitative approach with a case study design to gain an in-depth understanding of the utilization of Artificial Intelligence (AI)-based learning applications in enhancing students' religious digital literacy at MA Model Zainul Hasan Genggong. A qualitative approach was chosen because this study focuses on the interpretation of social and educational phenomena that occur naturally in the learning context, thus allowing the researcher to explore experiences, perceptions, and practices of AI usage holistically (Creswell, 2024).

The case study design is used because this research examines a single bounded system, namely the implementation of AI-based learning in the context of pesantren-based madrasahs. Case studies allow researchers to explore phenomena in a contextual and in-depth manner, especially in observing the integration of digital technology with the Islamic educational values that are characteristic in the madrasah environment (Sugiyono, 2024). MA Model Zainul Hasan Genggong was chosen as the research location because it has integrative characteristics between pesantren education and learning technology innovation, making it relevant to study the transformation of AI-based religious digital literacy.

The research subjects consisted of religious subject teachers, students, and madrasa management personnel involved in the implementation of learning technology. The selection of informants was carried out using a purposive sampling technique, which is the selection of informants based on certain considerations deemed to have knowledge and experience relevant to the focus

of the research (Moleong, 2024). This technique allows researchers to obtain rich and in-depth data related to the use of AI in religious learning.

Data collection techniques were carried out through participatory observation, in-depth interviews, and documentation studies. Observation was used to directly observe the AI-based learning process in the classroom. In-depth interviews were conducted to explore the understanding, experiences, and perceptions of teachers and students regarding the use of AI applications in enhancing religious digital literacy. Meanwhile, documentation was used to examine digital learning tools, modules, and AI application features used in the learning process (Miles, Huberman, & Saldaña, 2024).

Data analysis was carried out using the interactive model of Miles, Huberman, and Saldaña, which includes data condensation, data display, as well as drawing conclusions and verification. The analysis was conducted simultaneously from the time data was collected to ensure that the interpretation process proceeded continuously and in depth (Arikunto, 2021). This approach allows researchers to understand the patterns, themes, and meanings of AI implementation in religious learning systematically.

The validity of the data in this study is ensured through source triangulation and method triangulation techniques. Source triangulation is carried out by comparing information from teachers, students, and the madrasah, while method triangulation is carried out by comparing the results of observations, interviews, and documentation (Lincoln & Guba, 1985). In addition, the validity of the data is also reinforced through member checking to ensure the alignment of the researcher's interpretation with the informants' experiences in the field.

Thus, this research method is designed to provide a comprehensive understanding of the implementation of AI-based learning applications in enhancing students' religious digital literacy, while also capturing the dynamics of technology integration and Islamic educational values at MA Model Zainul Hasan Genggong in a deep and contextual manner.

FINDINGS AND DISCUSSION

FINDINGS

Based on the observations conducted at MA Model Zainul Hasan Genggong, it was found that the use of Artificial Intelligence (AI)-based learning applications has begun to be integrated into the teaching and learning process, particularly in religious education subjects. This integration is evident through

the utilization of various AI-powered digital platforms that support interactive learning, such as adaptive learning systems, educational religious chatbots, and verified Islamic knowledge search applications. The presence of these technologies has significantly transformed the learning process from a predominantly conventional approach to a more digital and participatory one.

In classroom learning activities, observations revealed that teachers no longer serve as the sole source of information. Instead, they act as facilitators who guide students in utilizing AI applications to access religious learning materials. Students appeared more active in searching for, comparing, and verifying religious information through the applications being used. This activity indicates an improvement in students' digital literacy skills, particularly in their ability to access information quickly and to identify relevant and credible sources.

Furthermore, it was observed that AI-based applications assist students in understanding complex religious materials through automated explanation features and personalized recommendations for advanced learning materials tailored to their level of understanding. This reflects a more personalized learning process, where AI adapts to the individual learning needs of students. In the context of religious digital literacy, these features contribute to helping students gain a deeper and more contextual understanding of Islamic concepts.

However, the observations also revealed several challenges in implementing AI utilization within the madrasah environment. Some students still tend to use applications passively without critically verifying the information they obtain. In addition, the limited understanding of AI technology among some teachers affects the optimization of its use in the learning process. This finding indicates that religious digital literacy depends not only on the availability of technology but also on the pedagogical competence and digital literacy of both educators and students.

Overall, the observation results indicate that the utilization of AI-based learning applications at MA Model Zainul Hasan Genggong has made a positive contribution to improving students' religious digital literacy, particularly in terms of information access, understanding of religious materials, and more dynamic learning interactions. Nevertheless, further enhancement of critical literacy skills and teacher guidance is still required to ensure that AI utilization can be implemented optimally, purposefully, and in accordance with the Islamic educational values upheld by the madrasah. The findings from the observations are also consistent with the interview results. The interview findings are

presented below.

Based on in-depth interviews conducted with teachers, students, and school administrators at MA Model Zainul Hasan Genggong, various perspectives were identified regarding the utilization of Artificial Intelligence (AI)-based learning applications in enhancing students' religious digital literacy. The interview data are presented in verbatim form to illustrate the experiences and perceptions of the informants directly from the field.

One of the religious education teachers stated that the use of AI has begun to generate positive impacts on the classroom learning process. He explained: "Since we began using AI-based applications in learning, students have found it easier to understand the materials. They can also seek additional explanations independently and are no longer entirely dependent on teachers." (Islamic Education Teacher, W1)

This statement indicates a shift in the teacher's role from being the primary source of information to becoming a learning facilitator. This finding is reinforced by another teacher's statement emphasizing the importance of guidance in the use of technology: "AI is helpful, but it still needs to be monitored. Not all the information it generates is necessarily aligned with the teachings we provide in the madrasah." (Religious Education Teacher, W2)

From the students' perspective, the use of AI-based applications is perceived as facilitating the learning process, particularly in understanding religious subjects that are often considered complex. One student stated: "Using AI is really helpful, Ma'am. We can ask questions directly and get answers quickly. So, if we do not fully understand something in class, we can review it again through the application." (Student, W3)

However, students also demonstrated an awareness that not all AI-generated information can be accepted without verification. Another student explained: "Sometimes I still check the information in religious texts or ask my teacher because I worry that the answers might be different or not entirely accurate." (Student, W4)

The madrasah administration also highlighted that AI integration is part of the institution's broader digital transformation efforts at MA Model Zainul Hasan Genggong. The principal explained: "We are actively promoting the digitalization of learning. AI has become one of the tools to help students become more digitally literate, especially in gaining a broader understanding of religious knowledge." (Principal, W5)

Nevertheless, the administration also emphasized several challenges in its implementation: "The main challenge is the readiness of both teachers and students. Not everyone can immediately adapt to AI technology, so training and continuous assistance are necessary." (W6)

Overall, the interview findings indicate that the utilization of AI-based learning applications contributes positively to the improvement of students' religious digital literacy, particularly in terms of information access and understanding of learning materials. However, there remains a significant need to strengthen critical literacy skills, information verification practices, and teachers' digital competencies to ensure that AI can be utilized effectively, purposefully, and in accordance with the Islamic educational values upheld by MA Model Zainul Hasan Genggong.

DISCUSSION

The research results indicate that the use of learning applications based on Artificial Intelligence (AI) at MA Model Zainul Hasan Genggong has made a significant contribution to improving students' religious digital literacy. These findings can be understood within the framework of the development of AI studies in education, which affirms that intelligent technology is capable of creating adaptive, personalized, and individual needs-based learning for students. In the context of this study, the use of educational chatbots, adaptive learning systems, and AI-based Islamic material search applications demonstrates a concrete implementation of the intelligent learning system concept that supports more flexible and interactive learning.

In line with that, (Arsyam & Zakirah, 2026; Iskandar, Thalal, Sari, & Azhari, 2026) emphasizing that AI in education is mostly used to support learning efficiency, learning data analysis, and increased access to information. Findings at MA Model Zainul Hasan Genggong reinforce this view, where students become more active in accessing, comparing, and verifying religious information through digital platforms. This indicates a shift in the learning paradigm from teacher-centered to learner-centered, as also stated by (Zalillah, 2026), that learning in the digital era greatly depends on the students' ability to independently build information networks.

Furthermore, (Samsudin, 2025) explaining that digital literacy not only includes technical skills, but also critical thinking, digital ethics, and the ability to evaluate information. In this study, these aspects appear to start developing among students, particularly in their ability to access and understand religious

materials. However, the interview findings indicate that critical literacy remains a challenge, as some students are not yet fully able to verify information generated by AI. This condition is in line with the findings (Nasution, Ritonga, & Nasution, 2025) which states that the main challenge of digital literacy among students is the low ability in critical information evaluation, even though access to technology is increasingly widespread.

From the perspective of digital Islamic education, this finding is also relevant to the concept of *tabayyun* in Islam, which emphasizes the importance of verifying information before believing and disseminating it. Research (Arifudin & Akil, 2025) emphasizing that digital literacy in Islamic education must integrate Islamic ethical values such as caution, verification, and moral responsibility in the use of digital information. This is reflected in the results of student interviews who stated that they still compare information from AI with books or ask teachers, which indicates the internalization of the value of *tabayyun* in the practice of religious digital literacy.

In addition, (Pamungkas, Putri, & Fajrussalam, 2024) criticizing that digital transformation in education is often not accompanied by the pedagogical readiness of educators. The findings of this study confirm this, where teachers at MA Model Zainul Hasan Genggong still experience limitations in optimizing the use of AI pedagogically. This is reinforced by research (Syakhrani, 2026) which shows that the success of AI integration in learning highly depends on the teacher's digital competence, not just on the availability of technology.

On the other hand, the concept of personalized learning put forward by (Fauzan, Amalina, & Ismail, 2026; Sinaga & Iskandar, 2024) This is also evident in the findings of this study, where AI helps students understand complex religious material through adjustments in difficulty levels and recommendations for advanced material. This reinforces the argument that AI can enhance the effectiveness of individual learning, especially in the context of religious material that requires conceptual and reflective understanding.

Overall, the results of this study indicate alignment with various international and national literature studies that highlight the role of AI in education, digital literacy, and learning transformation. However, this study also reveals a significant gap, namely the still weak critical literacy and pedagogical readiness of teachers in optimally integrating AI. Thus, this study expands previous research by providing new empirical context in Islamic education based on madrasah, particularly in the development of AI-based religious digital

literacy that not only emphasizes technological aspects but also Islamic values, ethics, and spirituality.

CONCLUSION

Based on the results of observations and interviews, it can be concluded that the use of learning applications based on Artificial Intelligence (AI) at MA Model Zainul Hasan Genggong provides a positive contribution in improving students' religious digital literacy. The integration of AI has transformed the learning pattern to be more interactive and participatory, where teachers act as facilitators, while students are more active in accessing, understanding, and verifying religious information through AI-based digital platforms. In addition, AI also supports more personalized learning through features that adjust materials according to students' needs. However, limitations are still found in the aspects of students' critical literacy and teachers' digital competence in optimizing the use of this technology.

The implications of this research indicate that the utilization of AI in religious learning not only requires technological readiness, but also the strengthening of digital pedagogy, critical literacy, as well as madrasa policies that support the ethical transformation of technology-based learning in accordance with Islamic values. The weakness of this study lies in its limited scope to a single research location and the absence of quantitative measurement of students' improvement in religious digital literacy. Therefore, future research is recommended to expand the research locations, use a mixed methods approach, and examine more deeply the long-term impact and variations in the use of AI applications in religious learning across various Islamic educational contexts.

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