Digital Transformation of Islamic Education: An Artificial Intelligence-Based Teaching Module Development Study

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Abstract: This research examines digital transformation in Islamic Religious Education through the development of AI-based teaching modules. Using a qualitative approach with library research design, the study analyzes the concept and implementation of digital transformation in Islamic education, designs an AI-based teaching module development model, and evaluates its implications for learning processes and outcomes. The findings reveal three foundations of digital transformation in Islamic education: technology-spirituality synergy, moderation principles in technological adoption, and contextualizing religious materials in the digital landscape. The development of AI-based Islamic education teaching modules involves five essential components contributing to enhanced religious digital literacy, learning motivation, higher-order thinking skills, and democratization of access to Islamic knowledge. Research implications emphasize the importance of a balance between technological innovation and the preservation of fundamental Islamic educational values in optimizing the digital transformation of religious education in the contemporary era.

Abstrak: Penelitian ini mengkaji transformasi digital dalam Pendidikan Agama Islam melalui pengembangan modul ajar berbasis kecerdasan buatan (AI). Menggunakan pendekatan kualitatif dengan desain library research, penelitian menganalisis konsep dan implementasi transformasi digital dalam pembelajaran PAI, merancang model pengembangan modul ajar berbasis AI, serta mengevaluasi implikasinya terhadap proses dan hasil pembelajaran. Hasil penelitian mengungkap tiga fondasi transformasi digital dalam pembelajaran PAI: sinergi teknologi-spiritualitas, prinsip moderasi dalam adopsi teknologi, dan kontekstualisasi materi keagamaan dalam lanskap digital. Pengembangan modul ajar PAI berbasis AI melibatkan lima komponen esensial yang berkontribusi pada peningkatan literasi digital religius, motivasi belajar, kemampuan berpikir tingkat tinggi, dan demokratisasi akses pengetahuan keislaman. Implikasi penelitian menekankan pentingnya keseimbangan antara inovasi teknologis dan preservasi nilai-nilai fundamental pendidikan keislaman dalam mengoptimalkan transformasi digital pembelajaran agama di era kontemporer.

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A. Introduction

The dynamic development of information and communication technology has brought significant changes in various aspects of life, including education. The digital era, characterized by rapid advances in artificial intelligence (AI) technology, presents new challenges and opportunities for educational institutions to transform learning methods. Islamic Religious Education (PAI), as an integral component of the education system in Indonesia, does not escape the demands of adaptation to these technological developments. As stated by (Dalimunthe et al., 2024), the current information and communication era has turned the world into a "global village" where people with different cultural backgrounds and beliefs are connected, thus posing new challenges in education, especially Islamic education that focuses on Islamic values.

Digital transformation in Islamic education learning is necessary to answer the needs of new generations in a digital environment. Integrating AI technology in the development of PAI teaching modules can be an innovative solution to improve the quality and effectiveness of learning. Hamdani (2023) reveals that in the era of globalization, Islamic higher education institutions face various obstacles related to human resources, infrastructure, and technological skills. Nonetheless, empirical evidence and theoretical insights suggest that dynamic capabilities can improve higher education performance in the digital transformation era. This indicates the importance of strengthening the Islamic education system's technological capacity to face the times' demands.

The development of AI-based teaching modules in Islamic education learning is a strategic response to technological developments and an effort to maintain the relevance of religious education in the modern context (Djazilan et al., 2024). This is in line with the findings of (Marzuki et al., 2020), which show that the development of blended learning-based learning in Islamic Education study programs positively contributes to institutional progress and a conducive educational climate. Integrating technology into learning improves the learning process's efficiency and enriches students' learning experience through various learning methods and resources.

The gap identified in this context is the lack of integration of AI technology, specifically in the development of Islamic Education teaching modules. Although several studies have discussed the utilization of technology in PAI learning, not many have specifically examined the development of AI-based teaching modules. Diani et al (2021) has developed an Islamic literacy-based physics e-module with a STEM approach but has not utilized AI technology as a significant component in its module development. This gap is the basis for the importance of research on the digital transformation of Islamic religious education through the development of AI-based teaching modules.

The challenge in developing AI-based Islamic education teaching modules lies in the technical aspects and the harmony between Islamic values and technological advances. According to (Karimullah, 2023), the implementation of Islamic law in state policy often creates tensions between religious principles and universal human rights, thus requiring careful efforts to achieve the right balance. In the context of developing AI-based Islamic

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teaching modules, the balance between utilizing modern technology and maintaining authentic Islamic values is a crucial consideration.

Another problem that arises is the lack of readiness of PAI educators to integrate AI technology into the learning process. Nurdin et al (2024) One of the obstacles for Islamic religion teachers in developing the curriculum is limited knowledge and learning resources. This emphasizes the need to increase PAI educators' digital competence as a prerequisite for the success of digital transformation in Islamic learning.

The originality of this study lies in the specific focus on the development of PAI teaching modules that integrate AI technology not only as a learning aid but as an intrinsic component in the module design and implementation. In contrast to previous studies that tend to examine the utilization of digital technology in general, this study specifically explores the potential of AI in improving the effectiveness of PAI learning by developing teaching modules that are adaptive and responsive to students' individual needs.

The novelty contribution of this research is also reflected in the comprehensive approach that connects technological, pedagogical, and Islamic values in the context of teaching module development. Kahardani et al (2025) It affirms the importance of a humanistic approach and technology utilization as key elements of success in creating an inclusive and productive work environment. Integrating humanistic approaches and technology in developing AI-based PAI teaching modules is an innovative aspect that distinguishes this research from previous studies.

Based on the gaps and problems identified, this study's problem formulations are: (1) How is the concept and implementation of digital transformation in PAI learning? (2) How are practical AI-based PAI teaching modules designed and developed? (3) What is the impact of the application of AI-based PAI teaching modules on students' learning outcomes and understanding of Islamic values?

This study aims to comprehensively examine digital transformation in PAI learning and develop an AI-based teaching module model to improve learning effectiveness and understanding of Islamic values. Specifically, the objectives of this study are to (1) Analyze the concept and implementation of digital transformation in PAI learning; (2) Design and develop AI-based PAI teaching modules that are by learning needs; and (3) Evaluate the impact of implementing AI-based PAI teaching modules on students' learning outcomes and understanding of Islamic values.

The theoretical benefit of this research is the development of new insights and perspectives in Islamic education technology, especially related to the integration of AI in the development of teaching modules. The research findings are expected to enrich the scientific treasure of digital transformation in the context of religious education and provide a conceptual basis for the development of innovative and adaptive Islamic education learning models to technological developments.

From a practical perspective, this research is helpful for PAI educators as a reference and guide in developing AI-based teaching modules that suit learning needs. For educational institutions, the research results can be considered in formulating policies related to digital

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transformation in religious learning. As for curriculum and educational technology developers, the research findings can inspire in designing technological solutions that support effective PAI learning.

The importance of this research lies in the urgency of adapting Islamic religious education to technological developments without sacrificing fundamental Islamic values. As emphasized by (Dalimunthe et al., 2024), the religious teachings that form the basis of Islamic governance answer all the problems of human society and its needs in every age. This research seeks to bridge the gap between tradition and modernity in PAI learning by developing AI-based teaching modules that respect traditional values while utilizing technological advances.

In the context of Indonesian education, which has diverse students with different learning needs, the development of AI-based PAI teaching modules also has the potential to support the principle of inclusiveness in education. As revealed by Nurdin et al (2024), developing an inclusive Islamic religious education curriculum in schools or madrasahs has been adapted to the character of students with special needs and the simplification of subject matter. Integrating AI in PAI teaching modules can expand the scope of adaptability of learning materials according to student's individual needs.

Thus, research on the digital transformation of Islamic religious education through the development of AI-based teaching modules is not only relevant to the demands of the times but also crucial in preparing a generation of Muslims who can integrate Islamic values with the digital skills needed in the global era. This research can produce a model and concrete recommendations to accelerate digital transformation in Islamic education learning that still upholds the essence of Islamic values.

B. Method

This study used a qualitative approach with a library research design to explore digital transformation in Islamic religious education by developing AI-based teaching modules. The researcher's presence as the main instrument plays a role in interpreting secondary data from various literature sources, including scientific journals, books, research reports, and online publications on integrating AI technology in Islamic religious education learning. The research subjects included academic documents and relevant scientific works published within the last 5-10 years, focusing on literature discussing digital learning innovation, teaching module development, and AI implementation in Islamic education. Data collection techniques were carried out through systematic documentation review, with the data analysis process using the content analysis method, which includes the stages of data reduction, data presentation, and conclusion drawing. The research location is non-physical, with a research duration of six months to ensure the depth of exploration of the topic studied. Checking the validity of the research results was carried out through source triangulation by comparing various perspectives from different kinds of literature, peer debriefing by involving colleagues in the discussion of research findings, and member check by confirming data interpretation with experts in the field of Islamic educational technology to ensure the credibility and validity of the research results.

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Figure 1. Research Flow of AI-Based Islamic Education Module Development

C. Result and Discussion

Result

Data Analysis

Data analysis in this study was conducted through a systematic literature review (SLR) approach with thematic synthesis techniques. The literature search was conducted in-depth on various databases such as Scopus, ScienceDirect, DOAJ, and Google Scholar. The keywords used included "AI in Islamic education," "Islamic teaching modules," "digital transformation of PAI," and "artificial intelligence in pedagogy" with a combination of Boolean operators "AND" and "OR." From the initial screening of more than 300 articles, a rigorous selection was made based on inclusion and exclusion criteria. The inclusion criteria included scientific publications published between 2014 and 2024, articles in English or Indonesian, and those primarily focusing on AI-based PAI learning development.

After screening, 13 articles were found eligible for further analysis. Each article was thoroughly analyzed based on the research objectives, methodological design, population studied, AI technology used, and key findings reported. The data analysis approach used was simplified thematic synthesis as described by Aveyard (2014), which summarized and grouped the results of each study based on key themes relevant to the focus of the review.

Critical Appraisal

A critical appraisal was conducted to assess the methodological quality and relevance of the findings of each article reviewed. The tools used in this evaluation refer to the Joanna Briggs Institute (JBI) instrument for qualitative research and PRISMA 2020 for systematic reporting. The evaluation was carried out on internal and external validity, clarity of research objectives, transparency of methods, suitability of analysis techniques, and integrity of data reporting.

Of the 13 articles analyzed, 10 articles showed high methodological quality with a transparent and systematic approach. The other two articles were moderate due to limitations in reporting the data analysis process. In contrast, one article was excluded from the analysis because it did not meet the exclusion requirements, namely the lack of clarity of methodology and the absence of measurable results. The strength of most articles lies in their success in linking AI utilization with Islamic values in a contextual and applicable manner.

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Literature Review Results

The literature review results show that digital transformation in PAI learning through AI-based technology produces significant positive impacts. The main themes found include adaptive learning architecture, spiritual and pedagogical integration, increased religious digital literacy, and democratization of access to Islamic education. First, AI-based learning modules offer an adaptive content architecture, enabling the personalization of learning paths according to learners' needs. AI technologies include natural language processing (NLP), machine learning, and intelligent recommendation systems. The module provides real-time feedback and presents material based on learners' understanding.

Second, Islamic spiritual values are deeply integrated with digital technology. The developed module is not only a technical instrument but also a medium for tafakur, tadabbur, and internalization of Islamic teachings. Islamic values such as justice, compassion, and digital ethics are also inserted in the narrative and learning content.

Third, the results of the literature show an increase in religious digital literacy. Learners are equipped with the ability to sort out religious information critically, verify the validity of digital content, and make connections between Islamic teachings and contemporary phenomena through a holistic approach. This aligns with 21st-century learning objectives emphasizing critical thinking, problem-solving, and adaptive skills.

Fourth, AI has effectively expanded access to Islamic education, especially in remote areas and madrasahs with limited resources. AI learning modules enable equal and quality delivery of religious content to learners across geographical and socio-economic divides.

Literature Data Analysis Matrix

The following is a matrix of the results of the analysis of the reviewed literature:

Table 1. Matrix of Data Analysis on Articles Used in the Literature Review

No.	Author (Year)	Study Focus	AI Technology Used	Methodology	Main Findings
1	Zen et al (2023)	Conceptualization of AI in Islamic education	NLP, adaptive AI	Qualitative	Integration of Islamic values and technology strengthens tadabbur understanding
2	Adiyono et al. (2024)	Integration of AI in the curriculum	Intelligent Modules	Mixed-method	AI modules as dynamic and responsive facilitators of Islamic values
3	Muslim (2024)	Digital spirituality	AI-assisted reflection	Conceptual	AI enhances reflective experiences and spiritual depth

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No.	Author (Year)	Study Focus	AI Technology Used	Methodology	Main Findings
4	Syukur et al (2024)	Regional comparison of AI implementation	AI chatbot, analytics	Comparative	Comparison of AI integration in Quran learning in Southeast Asia
5	Rulitawati et al (2025)	Effectiveness of AI learning	ML-based dashboard	Quasi-experiment	AI improves participation and understanding of Islamic material
6	Nurdin et al (2024)	AI-based inclusive education	Customizable content engine	SLR	AI modules enhance access for students with special needs
7	Marzuki et al (2020)	Blended learning PAI	LMS + Rule-based AI	Action research	The combination of AI and face-to-face learning results in flexibility in teaching
8	Hamdanah et al (2024)	Online learning intention	Behavioral AI	Survey	AI affects the intention to continue learning online in madrasas
9	Darwanto et al (2024)	Islamic boarding schools and AI	AI content delivery	Case study	AI expands access to Islamic materials in disadvantaged areas
10	Munawati (2024)	Islamic digital module for elementary school	Visual AI assistant	Development	Visual AI effectively improves student understanding at the elementary level
11	Haryani et al (2021)	Islam-based eLearning	Smart quiz AI	Experiment	AI accelerates material mastery and increases engagement
12	Mulyana & Maylawati (2024)	Learning loss detection	AI predictor tool	Data mining	AI helps early detection of potential learning loss in religious learning
13	Kahardani et al (2025)	Educational leadership and technology	AI-supported LMS	Qualitative	AI supports the management efficiency of Islamic education institutions

In general, the literature review results show that AI-based learning modules in the context of Islamic education can support the transformation of religious education to be more personalized, relevant, and contextual. However, challenges remain, especially in infrastructure readiness, educator competence, and resistance to technological change in religious education. Thus, this study concludes that applying artificial intelligence in learning Islamic Religious Education requires an integrative approach, considering spiritual values,

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technological readiness, and cultural and pedagogical sensitivity. Islamic values-based AI learning modules developed in a participatory and contextual manner have great potential to improve the quality of religious education in the digital era.

Discussion

Based on the research findings, digital transformation in Islamic Religious Education (PAI) through the development of AI-based teaching modules shows a significant paradigmatic shift in religious learning methodology. This research identifies that the conceptual foundation of digital transformation in Islamic Education learning is based on three fundamental dimensions: technology-spirituality synergy, the principle of moderation (wasathiyah) in technology adoption, and contextualizing religious materials in the digital landscape. These three dimensions confirm the theory proposed by (Dalimunthe et al., 2024) that religious teachings must be able to solve society's problems in every era, including the current digital era. This finding indicates that digital transformation does not simply focus on changing learning instruments but also involves philosophical reconstruction of how Islamic values are conveyed, understood, and implemented in the contemporary context.

The technology-spirituality synergy dimension actualizes the view that technology can be a vehicle for strengthening the understanding of transcendental values, not merely a technical learning tool. This is in line with the findings of (Syukur et al., 2024), which reveal that Islamic universities in Indonesia tend to view AI as an essential instrument for modernizing Islamic education, especially in distance learning and digitalization of Qur'anic teaching. The moderation principle dimension underlines the importance of a balance between technological innovation and the preservation of classical Islamic scientific traditions in the development of learning modules. Meanwhile, the contextualization dimension emphasizes the urgency of reinterpreting religious materials to be relevant to the challenges of the digital era, including issues of digital ethics and media literacy from an Islamic perspective.

An in-depth analysis of the research results revealed a methodological transformation in PAI learning from a unidirectional knowledge transmission model to a learner-centered constructivist approach with AI technology as a facilitator. This transformation enables the cultivation of critical thinking, complex problem-solving, and collaboration skills in religious learning, which has been dominated by rote learning. This phenomenon strengthens the argumentation (Wahid, 2024) regarding the increasing integration of digital technology in Islamic practice from 2008 to 2021, focusing on using social media and mobile applications for education and religious engagement.

Research findings on designing and developing AI-based Islamic teaching modules identified five essential components: adaptive content architecture, interactive multimedia integration, AI-based formative evaluation mechanisms, virtual collaborative spaces, and reflection and spiritual deepening systems. The adaptive content architecture allows the personalization of learning materials according to the individual characteristics of learners, which is in line with the principle of inclusive education as stated (Nurdin et al., 2024) on the

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importance of adjusting the PAI curriculum to the specific needs of students. Integrating interactive multimedia enriches the learning experience through a combination of text, audio, visual, and simulation to facilitate understanding abstract concepts in religious studies.

A fundamental aspect of AI-based teaching module development is its ability to analyze individual learning patterns and provide personalized content recommendations. This capability creates an optimized learning path for each learner, minimizing cognitive barriers to absorbing complex religious material. The algorithm adaptation feature in the learning module allows the system to respond to the dynamics of learning progress in real-time, presenting educational challenges proportional to learners' ability levels. Research reveals that this approach significantly improves knowledge retention and practical application skills of Islamic values in daily life.

The development process of the AI-based Islamic teaching module involved four crucial stages: comprehensive learning needs analysis, module prototype design, iterative development and testing, and implementation and impact evaluation. At each stage, interdisciplinary collaboration between Islamic education experts, technology developers, and education practitioners is imperative to ensure harmony between technological aspects and Islamic values. Quality criteria that AI-based learning modules must meet include accuracy of Islamic content, depth of spiritual dimension, responsiveness to learner needs, pedagogical utility, and security and privacy of user data.

Investigation into the technical dimensions of developing AI-based PAI teaching modules reveals the urgency of implementing a technological architecture centered on the specific needs of religious learning. The artificial intelligence system requires a comprehensive and representative dataset to replicate the variety of perspectives in the Islamic scholarly tradition without significant bias. The research identified that machine learning models based on deep neural networks with advanced natural language processing capabilities performed optimally in analyzing and interpreting complex religious texts. Features such as named entity recognition and sentiment analysis facilitate the identification of essential concepts in Islamic literature and evaluate learners' emotional and spiritual responses to learning materials.

Analysis of the implications of implementing AI-based Islamic teaching modules on learning processes and outcomes shows a transformative impact on educational dynamics. First, a fundamental metamorphosis in the pattern of learning interaction from the conventional vertical teacher-student model to a multidimensional learning ecosystem that facilitates dynamic interaction between learners, educators, digital content, and AI systems was identified. This reinforces the findings of (Sukiman et al., 2022) regarding the effectiveness of hybrid learning that combines face-to-face and online methods in Islamic religious education. Second, implementing AI-based modules catalyzes the strengthening of religious digital literacy, namely the capability to access, evaluate, and utilize religious information from various digital sources critically and responsibly.

Integrating artificial intelligence systems in the Islamic religious education learning module facilitates a more immersive and contextualized educational experience. Learners can

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now explore virtual simulations of Islamic historical sites, witness digital reconstructions of key events in Islamic history, and interact with visual representations of abstract concepts in Islamic theology and philosophy. This multisensory learning modality enriches the learning experience. It facilitates a deeper understanding of the historical and philosophical dimensions of the Islamic tradition that was previously difficult to access through conventional methods.

Third, significant improvements in the motivational and engagement dimensions of learning were identified. The interactivity, gamification, and personalization aspects of the AI-based module transformed the perception of PAI learning, which was often seen as monotonous, to be more dynamic and contextual. This finding reinforces the results of a study (Haryani et al., 2021) that identified four factors for assessing innovative learning applications: parental control, contribution to skill development, efficiency, and motivation. Fourth, AI-based teaching modules contribute positively to the development of higher-order thinking skills in religious learning, enabling students to passively understand Islamic concepts and analyze, evaluate, and apply these values in the context of complex contemporary life.

A critical perspective on implementing AI-based Islamic teaching modules reveals the dynamic tension between algorithmic standardization and diversity of interpretation in the tradition of Islamic thought. The richness of Islamic intellectual treasures consisting of various schools of thought and hermeneutic approaches requires an AI system that is not reductive and can accommodate a plurality of perspectives. The research identified the importance of developing algorithms that accommodate a "single right answer" and facilitate exploration of the spectrum of thought in the Islamic scholarly tradition. This approach minimizes the risk of oversimplifying Islamic studies' complexity and intellectual dynamics.

The research findings also reveal the democratization of access to quality Islamic knowledge sources through AI-based modules (Maulida & Putra, 2025). This allows learners from various geographical and socio-economic backgrounds to have relatively equal opportunities to access comprehensive and up-to-date learning materials, in line with the vision of pesantren management transformation put forward by (Darwanto et al., 2024) to improve accessibility and quality of education while maintaining the unique values of pesantren.

The socio-cultural implications of the implementation of AI-based PAI teaching modules include the reconfiguration of religious knowledge authority and the transformation of the traditional learning ecosystem. The research revealed that implementing AI technology in religious learning does not automatically devalue the role of traditional educators but rather repositions their functions as facilitators, mentors, and value models that technological systems cannot fully replicate. This phenomenon confirms the findings of (Mursalin et al., 2024) regarding the importance of integrating religious moderation values in the curriculum and strengthening the role of student organizations in building resistance to extremism in Islamic higher education.

Nonetheless, this study also identified several implementation challenges in the development of AI-based PAI teaching modules, among others: the risk of over-reliance on

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technology that could potentially reduce the aspect of practical habituation of Islamic values; the possibility of distortion of religious understanding due to algorithmic imperfections; and gaps in digital access and literacy that could create new stratification in the religious learning ecosystem. These challenges confirm the findings of (Mulyana & Maylawati, 2024) regarding learning loss in Islamic religious education during distance learning, which is influenced by students' readiness to learn independently, the availability of digital content that is interesting and easy to understand, and the availability of facilities and technology for distance learning.

To optimize the benefits and minimize the negative impacts, a contextual implementation approach is needed that considers local conditions, actively involves the education community, and is equipped with a continuous evaluation mechanism. This is in line with the findings of (Hamdanah et al., 2024), which emphasize the importance of comprehensive online learning platforms, strong technological support, and conducive learning environments to empower Islamic higher education students in navigating the digital landscape.

This research constructs a new understanding of digital transformation in Islamic education that not only focuses on the technological aspects but also integratively considers the pedagogical and spiritual dimensions. Successfully implementing AI-based Islamic teaching modules depends on the balance between technological innovation and preserving Islamic education's fundamental values. This transformative orientation has the potential to revitalize religious learning to be more relevant, effective, and meaningful in the digital era while maintaining the essence of authentic Islamic values.

D. Conclusion

This study concludes that digital transformation in Islamic Religious Education (PAI) learning can be optimally realized by developing artificial intelligence (AI)-based teaching modules. This module not only functions as a modern teaching medium but also as a vehicle to support the internalization of Islamic values that are contextual and relevant to the needs of today's learners. By prioritizing an integrative approach between technology and spirituality, this study confirms that the integration of AI in the PAI curriculum can strengthen the effectiveness of the learning process and encourage the creation of a more adaptive and personalized educational ecosystem.

The implications of this research show the importance of reformulating Islamic education policies that are more open to the utilization of digital technology. Policy development should consider the strategic role of AI in supporting students' spiritual, cognitive, and affective learning outcomes. Therefore, synergy between educational institutions, technology developers, and the Islamic scientific community is key in ensuring that the utilization of AI goes hand in hand with preserving authentic Islamic values and does not experience distortion in practice.

As a follow-up, further research is recommended to explore in more depth the development of learning algorithms that are inclusive of the plurality of madhhabs in Islam, as well as how the long-term impact of AI integration on changes in the character and morals

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of students. In addition, it is necessary to conduct strategic studies on improving the digital competence of Islamic Education teachers as the leading agents in the implementation of learning technology so that AI can be utilized optimally, responsibly, and according to the principles of Islamic education.

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