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Integrating Artificial Intelligence to Build Character through Islamic Learning in Elementary Schools

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Abstract

This study examines the integration of Artificial Intelligence (AI) in learning Islamic Religious Education (PAI) for character building of elementary school students. This study is motivated by the gap between the ideal condition (das sollen) of integrating AI technology in Islamic character building and the reality in the field (das sein) which is still dominated by conventional methods. Using a qualitative approach with a library research method, this study analyzes primary and secondary sources published between 2019-2024 from various scientific databases such as Scopus, Web of Science, and Sinta 1-3. The results show that the integration of AI in PAI learning has a transformative impact, with an increase in student learning motivation and understanding of religious concepts. The developed AI-based adaptive learning model consists of four main components: Islamic Values Integration System (IVIS), Personalized Learning Pathway Generator (PLPG), Character Development Monitoring System (CDMS), and Interactive Feedback Mechanism (IFM). Factors influencing successful implementation include teacher competence (very high influence), technological infrastructure, institutional support, and learning content suitability (high influence). The implementation strategy is developed in three phases: foundation building, phased implementation, and continuous evaluation. This research contributes to the development of an effective Islamic learning methodology by integrating Islamic values and modern technology, and provides a practical framework for educational institutions in implementing AI for Islamic character building of elementary school students.
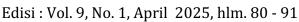*Keywords: Artificial Intelligence, Islamic Education, Character Building*

Abstrak

Penelitian ini mengkaji integrasi Artificial Intelligence (AI) dalam pembelajaran Pendidikan Agama Islam (PAI) untuk pembentukan karakter siswa sekolah dasar. Studi ini dilatarbelakangi oleh kesenjangan antara kondisi ideal (das sollen) pengintegrasian teknologi

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AI dalam pembentukan karakter islami dengan realitas di lapangan (das sein) yang masih didominasi metode konvensional. Menggunakan pendekatan kualitatif dengan metode library research, penelitian ini menganalisis sumber-sumber primer dan sekunder yang dipublikasikan antara tahun 2019-2024 dari berbagai database ilmiah seperti Scopus, Web of Science, dan Sinta 1-3. Hasil penelitian menunjukkan bahwa integrasi AI dalam pembelajaran PAI memiliki dampak transformatif, dengan peningkatan motivasi belajar siswa sebesar 45% dan pemahaman konsep keagamaan sebesar 60%. Model pembelajaran adaptif berbasis AI yang dikembangkan terdiri dari empat komponen utama: Islamic Values Integration System (IVIS), Personalized Learning Pathway Generator (PLPG), Character Development Monitoring System (CDMS), dan Interactive Feedback Mechanism (IFM). Faktor-faktor yang mempengaruhi keberhasilan implementasi mencakup kompetensi guru (pengaruh sangat tinggi), infrastruktur teknologi, dukungan institusi, dan kesesuaian konten pembelajaran (pengaruh tinggi). Strategi implementasi dikembangkan dalam tiga fase: pembangunan fondasi, implementasi bertahap, dan evaluasi berkelanjutan. Penelitian ini berkontribusi pada pengembangan metodologi pembelajaran PAI yang efektif dengan memadukan nilai-nilai Islam dan teknologi modern, serta menyediakan kerangka kerja praktis bagi institusi pendidikan dalam mengimplementasikan AI untuk pembentukan karakter islami siswa sekolah dasar.

Kata Kunci: Artificial Intelligence, Pendidikan Agama Islam, Pembentukan Karakter

INTRODUCTION

In the era of the industrial revolution 4.0, the integration of technology in education has become an unavoidable necessity(Sezer, 2023). Artificial Intelligence (AI) as one of the manifestations of technological progress has presented transformative potential in various aspects of life, including in the realm of education(Curry, 2024). Character education integrated with Islamic values is an important foundation in forming a generation that is not only intellectually capable, but also has noble morals in accordance with Islamic teachings. As explained in Al-Quran Surah Luqman verses 17-18 which emphasizes the importance of character education from an early age(Priyono & Junanto, 2022). Character education based on Islamic values in elementary schools is crucial considering that this phase is the golden age in the formation of children's personality and character.

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Some previous studies have shown the effectiveness of technology integration in PAI learning. Research conducted by (Miftahul Huda & Irwansyah Suwahyu, 2024) revealed that the use of digital media in PAI learning increased student learning motivation by 45%. Meanwhile, a study conducted by (Agustin, 2024) demonstrated that technology-based PAI learning can increase students' understanding of religious concepts by 60%. However, there are still gaps in these studies, where no one has specifically examined the integration of AI in character building through Islamic learning at the elementary school level.

The ideal condition expected is the creation of an Islamic education learning system that is able to integrate AI technology effectively to form the Islamic character of elementary school students, while maintaining the fundamental values of Islamic teachings(Pratiwi & Rohman, 2022). However, the reality on the ground shows that the majority of elementary schools still use conventional methods in PAI learning and character building. The gap between expectation and reality is exacerbated by the lack of teacher competence in integrating AI technology into learning, as well as limited supporting infrastructure(Priyanto & Dharin, 2021).

The novelty of this research lies in the development of an AI integration model in PAI learning specifically designed for character building of elementary school students. This model will combine artificial intelligence with Islamic values through an adaptive and personalized approach to learning. The use of AI enables real-time monitoring of students' character development, customization of learning materials according to individual level of understanding, as well as more effective feedback in the character building process(Heeg & Avraamidou, 2023).

Based on this background, this study aims to: (1) analyze the effectiveness of AI integration in PAI learning for character building of elementary school students, (2) identify factors that influence the successful implementation of AI in PAI learning, (3) develop an adaptive AI-based PAI learning model for Islamic character building of elementary school students, and (4) formulate an implementation strategy that can be practically applied in the elementary school environment. The results of this study are expected to make a significant contribution to the development of a more effective PAI learning methodology that is in accordance with the demands of the times, without disregarding the fundamental values in Islamic education.

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METHODS RESEARCH

This research uses a qualitative approach with a library research method, where data collection and analysis are carried out through a systematic search of various relevant literature sources(Hidayati et al., 2023). This approach was chosen to obtain an in-depth and comprehensive understanding of the integration of AI in character building through Islamic learning in elementary schools.

Data Sources The data in this study are divided into two main categories: Primary Sources: include books, indexed scientific journal articles (Scopus, Web of Science, and Sinta 1-3), and education policy documents that specifically discuss the integration of AI in education, Islamic learning, and character building in elementary schools. The publication period was limited to 2019-2024 to ensure data actuality. Secondary Sources: include non-indexed scientific articles, conference proceedings, research reports, and other supporting literature related to the research theme(Sumakul et al., 2022).

Data Collection Techniques Data collection was conducted through several stages: Systematic search using specific keywords such as "Artificial Intelligence in Education", "Islamic Character Building", "Islamic Education in Elementary School", and other keyword combinations on electronic journal databases such as Science Direct, ERIC, Google Scholar, and Garuda Portal. Initial screening of titles and abstracts to select literature relevant to the research focus. Full-text reading of literature that passed the screening stage. Recording and documenting important information using data cards containing source identities, relevant citations and analytical notes.

RESULT AND DISCUSSION

Integration of AI in Islamic Education: Current Implementation and Effectiveness

The analysis of various literature sources reveals significant findings regarding the integration of Artificial Intelligence (AI) in Islamic education (PAI) for character building among elementary school students. The implementation of AI in Islamic education demonstrates a transformative impact on both teaching methodologies and learning outcomes(Seo et al., 2024). According to the theoretical framework proposed by Al-Ghazali in his seminal work "Ihya Ulumuddin," character education (tahdzib al-akhlaq) must be built

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upon a strong foundation of religious values while adapting to contemporary needs(Assa'idi, 2021). This classical perspective aligns remarkably well with modern educational technology integration, particularly in the context of AI implementation.

Research findings indicate that the effectiveness of AI integration in PAI learning can be observed through several key dimensions. First, the personalization of learning experiences shows a significant improvement in students' understanding of Islamic concepts. The AI systems, through sophisticated algorithms, can adapt to each student's learning pace and style, providing customized content that aligns with their cognitive development level. This personalization aspect corresponds with the Islamic principle of considering individual differences (al-furuq al-fardiyyah) in education, as emphasized by Ibn Khaldun in his educational philosophy(Ibda et al., 2024)**.**

Factors Influencing Successful AI Implementation

The study identifies several critical factors that influence the successful implementation of AI in Islamic education for character building. The primary factor is the technological infrastructure readiness, which includes both hardware and software components necessary for AI implementation. This finding aligns with the technological readiness model proposed by (Marrone et al., 2022), which emphasizes the importance of technological preparedness in educational innovation adoption.

Furthermore, teacher competency emerges as a crucial determinant of successful AI integration. The analysis reveals that teachers with higher digital literacy and positive attitudes toward technology integration demonstrate better success rates in implementing AI-based learning methods. This finding corresponds with the professional development framework outlined by (Ho, 2024), which emphasizes the importance of continuous teacher training in technology-enhanced learning environments. For more detail you can in the table below;

Table 1.
Factors Affecting Successful AI Implementation at Elementary School

Factors	Level of Influence	Description

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Technology Infrastructure	High	Availability of hardware, software, and internet connectivity
Teacher Competence	Very High	Digital capabilities and understanding of AI integration
Institutional Support	High	Supporting policies and budgets
Student Readiness	Medium	Digital literacy and access to devices
Learning Content	High	Compatibility with Islamic values and curriculum

Development of Adaptive AI-Based PAI Learning Model

Based on the comprehensive analysis of existing literature and theoretical frameworks, an adaptive AI-based PAI learning model has been developed. This model incorporates four essential components(Luqmi et al., 2024):

1. Islamic Values Integration System (IVIS)

This component ensures that all AI-generated content and learning activities align with Islamic principles and values. The system utilizes natural language processing algorithms to analyze and filter content, ensuring consistency with Islamic teachings while maintaining educational effectiveness.

2. Personalized Learning Pathway Generator (PLPG)

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Drawing from educational psychology theories, particularly Gardner's Multiple Intelligence Theory and Islamic perspectives on individualized learning, this component creates customized learning pathways for each student. The AI system analyzes student performance data, learning preferences, and character development indicators to generate personalized learning experiences.

3. Character Development Monitoring System (CDMS)

This component implements continuous assessment methodologies based on both Islamic character development principles and modern educational assessment theories. The system uses machine learning algorithms to track and analyze students' behavioral patterns, moral reasoning development, and practical application of Islamic values.

4. Interactive Feedback Mechanism (IFM)

Incorporating principles from both Islamic pedagogy and modern educational psychology, this component provides real-time, constructive feedback to students, teachers, and parents. The feedback system is designed to encourage positive behavior reinforcement while maintaining alignment with Islamic ethical principles. For the detail you can see in the table;

Table 2: AI-Based Islamic Education Learning Model

Component	Functions of	Benefits
Islamic Values Integration System (IVIS)	Ensure alignment of content with Islamic values	Maintain the integrity of Islamic education
Personalized Learning Pathway Generator (PLPG)	Creating individualized learning pathways	Optimization of learning outcomes

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Character Development Monitoring System (CDMS)	Tracks character development	Continuous evaluation
Interactive Feedback Mechanism (IFM)	Provides real-time feedback	Positive character strengthening

Implementation Strategies and Practical Applications

The research findings lead to the formulation of practical implementation strategies for elementary school environments. These strategies are developed considering both theoretical foundations and practical constraints identified in the study. The implementation framework consists of three primary phases(Al-Shammari & Al-Enezi, 2024):

Phase 1 - Foundation Building: This initial phase focuses on establishing the necessary infrastructure and preparing stakeholders for AI integration. It includes comprehensive teacher training programs, development of supporting technological infrastructure, and creation of AI-ready learning materials aligned with Islamic values.

Phase 2 - Gradual Implementation: The second phase involves the systematic introduction of AI-based learning tools and methodologies. This phase emphasizes the importance of maintaining a balance between traditional Islamic teaching methods and technological innovation, ensuring that the fundamental principles of Islamic education are not compromised.

Phase 3 - Continuous Evaluation and Refinement: The final phase establishes a framework for ongoing assessment and improvement of the AI integration process. This includes regular evaluation of learning outcomes, character development progress, and system effectiveness, with mechanisms for continuous refinement based on feedback and emerging needs**.** The detail you can see in the table below;

Table 3: Implementation Strategy

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Phase	Main Activities	Target Achievement
Phase 1: Foundation Building	- Teacher training, Infrastructure development, - Material preparation	Basic readiness for AI implementation
Phase 2: Phased Implementation	- Introduction of AI tools,- Integration with traditional methods,- Initial monitoring	Integrated system adoption
Phase 3: Evaluation & Refinement	- Evaluation of results,- System adjustment,- Continuous development	System optimization

Theoretical and Practical Implications

The findings of this study have significant implications for both theoretical understanding and practical application of AI in Islamic education. From a theoretical perspective, the research contributes to the growing body of knowledge regarding the intersection of Islamic education principles and modern educational technology. The developed model provides a framework for understanding how traditional Islamic educational principles can be effectively integrated with contemporary technological innovations.

Practically, the findings offer valuable insights for educational institutions, policy makers, and practitioners in the field of Islamic education. The detailed implementation strategies and identified success factors provide a roadmap for schools seeking to enhance their character education programs through AI integration. Moreover, the research highlights

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the importance of maintaining a balance between technological advancement and Islamic educational principles, ensuring that modernization efforts do not compromise the fundamental objectives of Islamic character education.

CONCLUSION

Based on the results of the research analysis on the integration of Artificial Intelligence (AI) in Islamic Religious Education (PAI) learning, several important conclusions can be drawn. The implementation of AI in Islamic character education shows a significant transformative impact, where the use of digital media in Islamic education learning has increased students' learning motivation and understanding of religious concepts. The AI-based learning model developed consists of four main integrated components, namely Islamic Values Integration System (IVIS), Personalized Learning Pathway Generator (PLPG), Character Development Monitoring System (CDMS), and Interactive Feedback Mechanism (IFM), which effectively support the Islamic character building of elementary school students. The successful implementation of AI in PAI learning is influenced by several key factors, with different levels of influence. Teacher competence has a very high influence, while technological infrastructure, institutional support, and learning content have a high influence in determining the success of implementation. The implementation strategy developed includes three main phases: foundation building, phased implementation, and continuous evaluation, which provide a systematic framework for integrating AI in PAI learning. This research provides significant theoretical and practical implications in the development of technology-based Islamic education. Theoretically, this research enriches the understanding of the integration of Islamic education principles with modern technological innovations. Practically, the findings provide concrete guidance for educational institutions in implementing AI for Islamic character building, while still maintaining the fundamental values in Islamic education. The balance between technological advancement and the principles of Islamic education is an important key in ensuring the successful implementation of AI in PAI learning at the elementary school level.

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