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Readiness of Islamic Religious Education Teachers in Utilizing Artificial Intelligence at SMPN 1 Salatiga to Support SDGs in Education

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Abstract

Purpose: The purpose of this research is to examine the level of readiness among Islamic Religious Education (IRE) teachers in employing Artificial Intelligence (AI) within the instructional process and to explore the challenges associated with integrating AI into IRE teaching at SMPN 1 Salatiga. This study is conducted in alignment with the pursuit of quality education as outlined in the Sustainable Development Goals (SDGs). **Theoretical Framework:** The research is based on Maddox's (2000) theory of teacher readiness, which includes three main dimensions. This framework was employed to assess the extent to which IRE teachers are prepared to utilize AI technology in the learning process and to relate it to Islamic values. **Literature Review:** This study reviews previous findings concerning AI utilization in education, teacher readiness theory, and the incorporation of AI within Islamic educational contexts. However, studies that specifically examine teachers' readiness for AI in the context of Islamic educational institutions remain limited. **Method:** This study employed a qualitative descriptive design, with data collected through on-site school observations, semi-structured interviews involving the principal, IRE teachers, and two students, as well as document analysis of pertinent IRE teaching materials. To enhance the credibility and depth of the results, a triangulation method was implemented to obtain a comprehensive perspective on the phenomenon under investigation. **Results:** The results indicate that IRE teachers demonstrate a high level of readiness in utilizing AI technology, encompassing cognitive, emotional–attitudinal, and behavioral aspects. Nevertheless, several challenges remain, including limited facilities, low digital literacy, unequal access to technology, information bias, and AI-generated content inconsistencies with Islamic values. **Implications:** This study provides valuable implications for educators and policymakers by emphasizing the importance of readiness in implementing AI-based learning, particularly in IRE instruction. **Novelty:** The novelty of this research lies in its focus on analyzing the readiness of IRE teachers in utilizing AI, emphasizing Islamic values and the goals of sustainable education. It highlights the ethical and spiritual dimensions of IRE teachers in responding to digital transformation and offers a new perspective on balancing technological competence with moral–spiritual responsibility in AI-based learning.

Keywords: teacher readiness, artificial intelligence, islamic religious education teachers, sustainable development in education, digital transformation.

INTRODUCTION

The swift progression of information and communication technologies has profoundly reshaped social dynamics as well as industrial frameworks [1]. Human civilization continues to evolve dynamically as a result of progress in information technology and digital science [2]. The massive impact of this revolution has permeated nearly all aspects of life, including the education sector [3]. One of the remarkable products of technological sophistication is AI, which offers a wide range of potential applications to enhance the effectiveness of education [4]. Specifically in IRE learning, the traditional teacher-centered approach is considered less interactive and often misaligned with the characteristics of today's digital generation [5]. Therefore, the utilization of AI serves as a relevant alternative solution to improve the quality of IRE education in the digital era.

The incorporation of technology, particularly AI, in the education sector serves as a crucial driver in promoting the fourth goal of the SDGs, which aspires to ensure inclusive and equitable quality education for all. Quality education in this context, emphasizes inclusivity, fairness, and excellence across all levels of society, including through digital innovation and the adoption of AI [6]. In IRE learning, the implementation of AI not only serves as a pedagogical innovation but also as an active contribution of Islamic education to realizing sustainable, ethical, and equitable development [7].

SMPN 1 Salatiga serves as a relevant example. This public junior high school in Central Java has demonstrated a strong commitment to improving educational quality through the use of AI-based learning media [8]. The school's efforts to enhance the quality of education through AI integration represent a progressive step. According to the school principal, Ngadiman, the use of AI technology is essential for creating more effective learning strategies.

Despite the extraordinary progress in information technology, the teacher's role remains crucial in sustaining the learning process. However, teachers must undergo a transformative process fundamental paradigm shifts in classroom practice have become essential [9]. To address the requirements of 21st-century learning, educators are encouraged to develop technological literacy by integrating tools such as the Internet of Things (IoT), Virtual and Augmented Reality (VR/AR), and AI as tools for identifying and addressing learners' needs. In this regard, teacher readiness has become both a challenge and a focal point in the implementation of AI-based learning [10].

A teacher readiness survey conducted by the Asia-Europe Foundation (ASEF) in 2024, involving 458 teachers from Asia and Europe, including Indonesia, revealed that only 35% of Indonesian teachers felt ready to integrate AI into their teaching practice [11]. Readiness refers to a teacher's physical and mental capacity or potential ability to perform a given task [12]. According to Jayanti in the *Early Childhood Education Journal*, the components of teacher readiness include (1) emotional–attitudinal readiness, (2) cognitive readiness, and (3) behavioral readiness [13]. Furthermore, school infrastructure readiness, internet access, available devices, and institutional support all remain significant challenges in integrating technology into learning.

Findings by Klarisa, et al. (2023) on the analysis of AI learning readiness in elementary schools indicate that readiness must be viewed comprehensively across four dimensions: student readiness, teacher readiness, curriculum readiness, and infrastructure readiness. These four dimensions must be well-integrated to ensure effective AI-based learning [14]. Similarly, Putra (2024) found that the use of AI in primary education can enhance student engagement, provide instant feedback, and assist teachers in developing effective learning strategies [15].

Observations on May 23, 2025, indicate that 21st-century learning demands critical thinking skills and technological competence. As professionals, teachers must continuously develop their pedagogical skills to adapt to and navigate ongoing

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advancements in science and technology. Hence, readiness for AI-based learning must become a priority to ensure teaching effectiveness.

This study differs from previous research in that it focuses specifically on analyzing IRE teachers' readiness and the challenges associated with AI-based IRE instruction a substantive distinction from prior studies, which generally examined AI learning readiness and influencing factors in broader educational contexts.

This research seeks to evaluate the level of readiness among IRE teachers in employing AI at SMPN 1 Salatiga and to explore the challenges encountered in implementing AI-integrated learning. The outcomes of this study are anticipated to provide theoretical insights that enrich the understanding of teachers' preparedness for AI-driven instruction in schools, as well as offer practical guidance for educators and policymakers in enhancing the effective application of AI within IRE teaching practices.

LITERATURE REVIEW

Over the past decade, the incorporation of Artificial Intelligence (AI) within the educational sphere has become a prominent focus of academic inquiry, with its impact increasingly extending to the field of IRE. AI has the potential to support personalized learning, automated assessment, and adaptive feedback for students. However, optimizing this potential largely depends on the level of teacher readiness. Teacher readiness refers to a teacher's willingness and ability to act and respond effectively in particular situations [16]. In technology-based IRE learning, readiness is understood as the teacher's intellectual, emotional, technical, and ethical capacity to prepare, operate, utilize, and manage technology within the IRE learning process.

The readiness of IRE teachers in utilizing AI emphasizes the integration of knowledge, pedagogy, technology, ethics, and spirituality. IRE teachers are not only expected to understand the functional aspects of AI technology but also to ensure that its use strengthens Islamic values, manners (*adab*), and students' spirituality. In line with this, Garzón's (2025) study reveals that perceived usefulness and technological complexity are the main determinants influencing teachers' readiness to adopt AI. In educational settings, technological complexity refers to the extent to which teachers perceive AI as difficult to integrate into classroom practices. Within Islamic education, this complexity affects not only technical dimensions but also ethical and normative considerations [17].

The integration of AI technology into IRE learning contributes to achieving SDG 4 by promoting inclusive and equitable quality education. However, realizing this goal requires continuous professional training, the development of ethical guidelines for AI use based on Islamic principles, and adequate institutional and infrastructural support [18].

Nevertheless, the literature highlights certain gaps and controversies surrounding AI integration in IRE learning. Some scholars argue that AI enhances learning effectiveness by providing interactive materials and automated feedback, while others warn that it may diminish the humanistic and spiritual dimensions of religious education [19]. Furthermore, there is a scarcity of empirical studies specifically examining the readiness of IRE teachers toward AI in the context of *madrasah* or Islamic educational institutions in Indonesia. Most existing studies remain conceptual, focusing on the effects of AI training on teacher competence. Therefore, this study seeks to provide an empirical overview of IRE teachers' readiness to utilize AI technology and to identify the challenges in integrating it in accordance with Islamic values. The findings are expected to encourage more innovative IRE learning practices and serve as a model for other schools in applying technology wisely and ethically.

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METHODOLOGY

This study employed a qualitative method with a field study approach to describe conditions or phenomena based on naturally obtained data without manipulating any variables [20]. The research was conducted in May at SMPN 1 Salatiga, a public junior high school selected because it had already begun integrating AI technology into its learning process, particularly within IRE subjects. Additionally, this research is in line with the fourth objective of the SDGs, which underscores the goal of ensuring inclusive and equitable quality education for all. The research drew upon both primary and secondary sources of data. Primary data were collected through comprehensive interviews with key informants relevant to the study's variables, namely the school principal, IRE teachers, and students. Secondary data were obtained from documentation, including lesson plans (RPP) prepared by IRE teachers, which were analyzed to assess the extent to which AI technology use aligns with the principles of SDGs-oriented education [21].

Data collection techniques included interviews and documentation [22]. These methods were employed to observe the readiness of IRE teachers in utilizing AI, as well as to identify challenges and opportunities that arise in supporting quality, technology-based education. The validity of the data was tested through source triangulation by collecting information from various informants who provided diverse yet relevant perspectives [23]. The data analysis process adopted the Miles and Huberman framework, which comprises three essential phases: data condensation, data display, and conclusion drawing or verification. This analytical approach allowed the researcher to systematically structure the data, conduct a comprehensive interpretation of the findings, and draw valid conclusions regarding the contribution of IRE teachers' readiness to the implementation of AI-based learning aligned with the goals of quality education under the SDGs framework [24].

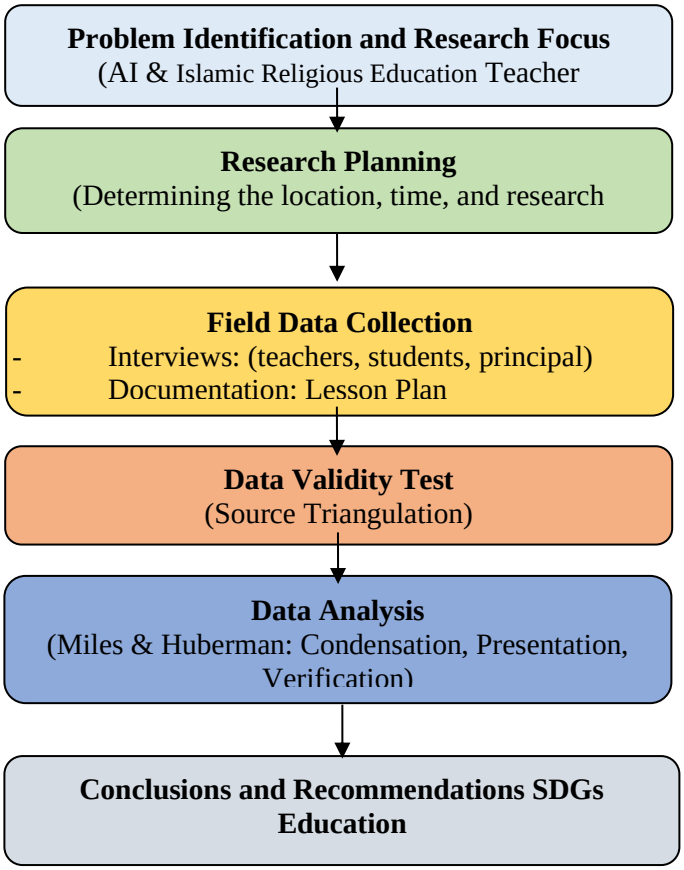

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Figure 1. Research Methodology Flowchart

RESULTS AND DISCUSSION

Based on interviews with the school principal, Islamic Religious Education (IRE) teachers, and two students, as well as documentation at SMPN 1 Salatiga, the readiness of teachers in utilizing Artificial Intelligence (AI) technology in learning is categorized as high. Starting with cognitive readiness, IRE teachers have demonstrated a sound understanding of AI concepts and their applications in the learning process. They have been equipped with knowledge of AI technology through various school-organized programs. In terms of emotional–attitudinal readiness, IRE teachers consistently seek new information and adapt to technological developments. They also integrate technology into their lessons by linking it with Islamic values. Behavioral readiness is reflected in teachers' direct use of AI in instructional activities. IRE teachers have integrated multiple disciplines in designing AI-based IRE learning, including technology, educational psychology, and digital visualization.

The school also provides several programs to support AI-integrated learning, such as the KOMBEL (Learning Community) program, which functions as a collaborative platform for teachers across subjects to share knowledge, experiences, and skills in developing innovative teaching methods, including AI-based learning. In addition, SMPN 1 Salatiga regularly holds workshops aimed at improving teachers' competencies.

The use of AI in IRE instruction has generated significant positive impacts; however, it also presents notable challenges for the school in integrating AI tools into the learning process, particularly within IRE subjects. At SMPN 1 Salatiga, several challenges were identified, including insufficient facilities, where the large-scale demand for AI integration has driven the school to improve technological infrastructure, yet budget constraints continue to limit progress. Another challenge involves low digital literacy among teachers and students, which hinders the effective implementation of AI in IRE learning. Unequal access to technology further exacerbates the issue, as some students struggle due to the lack of personal devices capable of supporting AI applications. Additionally, information bias and the misalignment of AI-generated content with Islamic values pose ethical concerns, as unfiltered AI use can diminish the spiritual and moral dimensions that are central to IRE. These findings indicate that although IRE teachers at SMPN 1 Salatiga demonstrate strong cognitive, emotional, and behavioral readiness for AI-based learning, infrastructural and ethical challenges remain critical issues that require institutional attention and sustained support.

Table 1. Teachers' Readiness to Utilize AI

No	Teacher Components Readiness	Findings
1	Cognitive Readiness	The IRE teachers have been equipped by the school institution with knowledge of AI technology through various programs, including *KOMBEL* (Learning Community) and annual workshops. The IRE teachers utilize digital tools for instructional purposes in their lesson plans (RPP). They understand AI, are capable of filtering AI-generated outputs, evaluating and aligning them with Islamic values, and critically designing appropriate learning strategies.
2	Attitudinal and Emotional Readiness	The teachers are motivated by values such as responsibility and sincerity, which encourage continuous innovation,

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		including in IRE learning that incorporates AI, while maintaining openness with students in using technology. The IRE teachers consistently seek new information and adapt to technological developments, particularly in the use of AI. They also design lesson plans grounded in Islamic values.
3	Behavioral Readiness	The teachers are accustomed to using ChatGPT, Canva AI, and Quizizz, integrating these tools into IRE lessons, such as in *akhlaq* (moral) education. The IRE teachers also design AI-based learning activities in their lesson plans (RPP).

Table 2. Challenges of Integrating AI into PAI Learning

No	Type of Challenge	Findings
1	Inadequate Facilities	The improvement of school internet network capacity remains constrained due to limited funding. Data storage is still dependent on the Ministry of Communication and Information Technology (*KOMINFO*) because of the large amount of data required.
2	Digital Literacy	Several students and teachers across different subjects particularly in IRE are not yet accustomed to using AI technology. IRE teachers have not been fully equipped with specialized AI training to use and respond to AI appropriately.
3	Unequal Access to Technology	Not all students own personal devices or mobile phones capable of supporting AI applications. Some students still lack understanding of how to use certain AI tools, thus requiring guidance and assistance from teachers.
4	Information Bias and Alignment of AI Content with Islamic Values	AI-generated information is sometimes invalid or biased, resulting in non-objective content. The language and tone of AI-generated outputs often do not align with the values emphasized in IRE learning.

Teachers' Readiness in Utilizing AI in Islamic Religious Education Learning at SMPN 1 Salatiga

Readiness is understood as a comprehensive condition of an individual, encompassing physical, mental, and emotional aspects that enable them to respond appropriately to a given

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stimulus or situation [25]. This notion is reinforced by Slameto in Kamila (2024), who explains that readiness refers to a person's condition that allows them to respond to a situation in a particular way [26]. The quality of such responses is influenced by one's existing state or circumstances. Teacher readiness, therefore, reflects a teacher's level of physical, mental, and experiential maturity, which enables them to carry out learning activities effectively [27].

In recent years, AI has become a key driver of educational transformation, reshaping teaching and learning paradigms. Its presence has altered learning models, opening opportunities for more personalized approaches tailored to individual student needs. AI also assists teachers in assessing students' work automatically, making the learning process more efficient. Furthermore, AI supports student collaboration by analyzing their interests and facilitating knowledge-sharing within more interactive and open learning environments [28].

Based on the findings from SMPN 1 Salatiga, teachers' readiness particularly that of IRE teachers in utilizing AI can be viewed through three dimensions: (1) emotional attitudinal readiness, (2) cognitive readiness, and (3) behavioral readiness. This classification aligns with Maddox's (2000) framework, which identifies three key dimensions of teacher readiness: emotive attitudinal readiness, cognitive readiness, and behavioral readiness [29].

Emotional attitudinal readiness refers to an individual's sense of responsibility and enthusiasm in performing tasks, as well as their willingness to adapt as needed throughout the process [30]. Interview findings show that IRE teachers at SMPN 1 Salatiga demonstrate a strong sense of responsibility and enthusiasm in teaching. They integrate Islamic values and *da'wah* (religious propagation) using approaches that appeal to the younger generation, including AI-based technologies. The integration of AI into IRE learning is also reflected in teachers' lesson plans, which are designed to foster both *fikr* (intellectual reflection) and *dzikr* (spiritual awareness), ultimately guiding students toward intellectual and moral development that benefits themselves and society [31].

Teachers with emotional stability are generally better prepared for teaching. The emotional attitudinal readiness of IRE teachers is evident in their efforts to seek and adapt to new information [32]. Consistent with interview results, IRE teachers actively update their knowledge and demonstrate openness in using AI technologies with students. Such emotional stability and adaptability enable teachers to face diverse classroom situations, continue learning, and evolve in response to emerging challenges [33].

Cognitive readiness, on the other hand, refers to the teacher's critical thinking ability in performing tasks and integrating concepts and tools from various disciplines. In the context of AI-based IRE learning, cognitive readiness entails intellectual competence in understanding AI concepts, recognizing the benefits and risks of AI use, and mastering subject content that can be integrated with such technology [34]. It also includes the ability to develop technology-based instructional materials, combine modern pedagogical methods with Islamic values, and design learning approaches that address both the cognitive and affective domains of students [35].

In this era, teachers are expected to possess interdisciplinary skills, especially in designing learning strategies that combine religion, technology, and culture. Therefore, digital proficiency and AI literacy must go hand in hand with religious understanding so that teachers can guide students creatively, innovatively, and adaptively. Interviews revealed that IRE teachers at SMPN 1 Salatiga exhibit strong critical thinking skills through their understanding of AI, the integration of AI in lesson plans, and the use of content filtering and evaluation processes to ensure alignment with Islamic principles. Their cognitive readiness is further reflected in

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their ability to adjust teaching strategies and approaches to foster students' active and creative engagement [36].

Behavioral readiness encompasses teachers' willingness to collaborate with colleagues and manage time effectively to achieve instructional goals. In this regard, behavioral readiness refers to teachers' concrete actions in using AI during instruction, such as participating in training programs, developing interactive AI-based learning media, and experimenting with new tools. It also includes the readiness to continually identify effective ways to meet students' learning needs, including through ongoing coordination with parents [37]. Interview results reveal that IRE teachers at SMPN 1 Salatiga frequently use AI tools to design interactive lessons and incorporate technology into lesson plans to make learning engaging, enjoyable, and thought-provoking.

The readiness of IRE teachers to utilize AI aligns with SDG 4 and SDG 9, which emphasize educational transformation through technological innovation and teacher capacity building [38]. As AlSagri & Sohail (2024) argue, AI implementation can support equitable access to education and enhance instructional efficiency while preserving moral and social values. Thus, IRE teachers' readiness extends beyond technical competence to encompass a strategic role in ensuring that education remains high in quality, character-driven, and sustainable [39].

Challenges in Integrating AI into Islamic Religious Education Learning at SMPN 1 Salatiga

The integration of AI into IRE learning offers tremendous potential for improving instructional effectiveness [40]. With its capacity to tailor materials to individual student needs and provide rapid feedback, AI can enhance efficiency and engagement in the learning process [41]. However, AI implementation particularly in IRE still faces multiple complex challenges, including low digital literacy among teachers, inadequate facilities, unequal access to AI technologies, and issues of information bias and accuracy [42].

At SMPN 1 Salatiga, both teachers and students exhibit limited digital literacy, reflected in their unfamiliarity with AI applications. Teachers often lack a full understanding of how AI systems operate, how to manage data securely, and how to assess the accuracy and relevance of AI-generated content. Judijanto (2024) similarly found that digital literacy levels among educators and students in Indonesia remain relatively low, hindering optimal use of AI in the classroom [43]. Teachers' readiness in digital literacy continues to pose challenges in adopting AI, with many struggling to operate technological tools, use digital applications effectively, and manage ethical and security concerns. Moreover, teachers' digital literacy is influenced by educational background, teaching experience, and institutional or governmental support [44]. In this regard, digital literacy related to AI must encompass not only technical proficiency but also critical, informational, and ethical literacy.

Another major challenge lies in infrastructural limitations. The findings indicate that network capacity upgrades remain constrained by insufficient funding. Julianti (2025) noted that while AI features simplify learning, disparities in digital infrastructure especially across Indonesia's diverse geographic and socio-economic regions must be addressed. Unequal access to digital infrastructure remains a primary obstacle to integrating AI into education [45].

Infrastructure readiness forms the foundation for successful AI integration within any institution. The *OECD Digital Government Outlook* (2022) report emphasizes that effective AI integration depends on a nation's adaptability to technological change. In Indonesia, however, many rural and underdeveloped areas continue to experience infrastructural disparities. This inequality creates a significant gap

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between well-equipped and under-resourced schools, potentially lowering overall education quality if left unresolved. Consequently, teachers must adopt adaptive strategies to ensure all students are adequately supported [46].

Information bias and the inconsistency of AI-generated content with Islamic values present additional ethical challenges in AI integration. The convenience of AI may lead students to engage in instant-thinking habits—relying on AI outputs without verifying accuracy or sources critically. At SMPN 1 Salatiga, such tendencies were observed among students, while teachers reported frequent challenges in filtering AI content that did not align with IRE materials. Alfiannur (2025) found that AI systems often inherit biases from their training data, leading to potential unfairness in teaching and assessment. From a religious standpoint, AI systems' broad access to diverse information sources also risks generating content inconsistent or even contradictory with Islamic principles. Therefore, caution and ethical consideration are essential in AI application, particularly in value-based education [47].

In this context, teachers play a vital role not only in transmitting AI-generated information but also in guiding students to verify, interpret, and evaluate such content critically. As facilitators, teachers must engage actively to foster trust, encourage discussion, and ensure that learning remains ethical and meaningful. Consequently, while AI offers numerous advantages, the teacher's presence remains indispensable to maintain balanced, value-driven, and spiritually grounded education. Teacher and staff training programs must also be strengthened to enhance understanding and responsible use of AI technologies. Furthermore, the involvement of religious communities and other stakeholders is essential to ensure that AI use aligns with societal and Islamic ethical values [48].

These challenges closely relate to SDG 10, which emphasizes reducing inequalities in educational access. Disparities in digital infrastructure, technological literacy, and teacher readiness reflect broader gaps in equitable AI utilization for inclusive learning [49]. Research by Liu et al. (2022) affirm that educational equality serves as a key indicator for achieving long-term sustainability in education [50]. Therefore, Therefore, integrating SDG principles into AI-based Islamic education policies must be prioritized to promote justice, inclusivity, and sustainability in IRE instruction.

CONCLUSION

The findings of this study indicate that Islamic Religious Education (IRE) teachers at SMPN 1 Salatiga demonstrate a high level of readiness in utilizing Artificial Intelligence (AI) technology in learning. This readiness encompasses cognitive, attitudinal, and behavioral aspects. Cognitively, teachers understand the concepts, benefits, and risks of AI use and are able to integrate it into instructional practices. From an attitudinal perspective, teachers exhibit responsibility, enthusiasm, and adaptability toward technological advancements. Behaviorally, teachers demonstrate active engagement in integrating AI into their instructional practices. The adoption of AI signifies a forward-moving initiative that fosters inclusivity, innovation, and educational equity, thereby contributing to the realization of Sustainable Development Goal (SDG) 4 on Quality Education. However, challenges persist, including limited facilities, low digital literacy, and potential AI content bias. Therefore, IRE teachers play a crucial role in ensuring that digital transformation remains grounded in Islamic values and contributes to students' moral and character development.

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Education studies integrating Artificial Intelligence (AI) technology in alignment with Islamic values and the SDGs in education.

Author Contribution

All authors were equally involved in the conceptual design of the study, data analysis, and manuscript development. This research was conducted as a joint collaboration between scholars from the State Islamic University (UIN) of Salatiga and Al-Azhar University, Cairo, with a shared focus on examining the readiness of Islamic Religious Education teachers in implementing Artificial Intelligence (AI) to advance the Sustainable Development Goals (SDGs) in the field of education.

Conflicts of Interest

The authors affirm that no conflicts of interest arose during any phase of this research, including its planning, execution, or reporting stages. The study was conducted and presented objectively, authentically, and with full scientific accountability.

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