

Date Received : December 2025
Date Revised : May 2026
Date Accepted : May 2026
Date Published : May 2026

A SYSTEMATIC LITERATURE REVIEW ON THE DEVELOPMENT OF PEDAGOGICAL COMPETENCIES AMONG ISLAMIC RELIGIOUS EDUCATION TEACHERS IN THE DIGITAL AGE

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Keywords:

Artificial Intelligence;
Digital Literacy;
Digital Pedagogy;
Educational
Technology; Islamic
Religious Education;
Pedagogical
Competence.

ABSTRACTS

The rapid advancement of information technology in the 21st century has significantly transformed education, including Islamic Religious Education (PAI). In this digital era, teachers are required to adapt to increasingly open access to information and dynamic learning environments. This condition demands adaptive and innovative pedagogical competencies, enabling teachers to integrate digital technology effectively while maintaining Islamic values. This study aims to examine the challenges and opportunities in strengthening PAI materials in the digital age, focusing on curriculum transformation, pedagogical innovation, technology integration, and teachers' digital competencies. Despite growing research on digital education, a gap remains in understanding how PAI teachers can holistically integrate digital pedagogy while preserving Islamic values a gap this review specifically addresses. This study uses a systematic literature review approach based on the PRISMA framework. Relevant studies published between 2015 and 2025 were collected from Google Scholar, Scopus, and ERIC. The selection process applied clear inclusion and exclusion criteria to ensure the quality and relevance of the studies. Data were analyzed thematically to identify key patterns and trends in developing pedagogical competencies in digital-based Islamic education. The findings indicate that pedagogical competence development is influenced by flexible curriculum design, innovative teaching approaches, technology integration, and the reinforcement of Islamic values. A key trend identified is the increasing adoption of AI-based personalized learning, while a critical gap remains in empirical evidence on the long-term outcomes of technology integration in Islamic education contexts. Approaches such as discovery learning, deep learning, and gamification enhance student engagement and understanding. Digital technologies, including artificial intelligence, enable personalized and more effective learning. However, challenges such as limited infrastructure, low digital literacy, and teachers' readiness remain significant barriers, particularly in remote and under-resourced settings. In conclusion, strengthening PAI teachers' pedagogical competencies requires a holistic approach that integrates curriculum flexibility, pedagogical innovation, and ethical use of technology aligned with Islamic values.

A. INTRODUCTION

The 21st century is marked by rapid advances in information technology that have brought about major changes in various fields, including education. In the context of Islamic Religious Education, this situation presents a unique challenge for teachers. They must be able to deliver instructional content effectively in the era of globalization, where students have extensive access to information. Therefore, Islamic Religious Education (PAI) teachers are required to possess adaptive and innovative pedagogical competencies to effectively utilize digital technology in the learning process (Johariyah & Samsuddin, 2024). This study will examine the challenges and opportunities in strengthening Islamic Religious Education (PAI) materials in the digital era, with a focus on content transformation, technology integration, and the development of teachers' digital competencies. This research employs a literature review method to analyze current literature from various academic and professional sources, identifying the need to reconstruct Islamic Education (PAI) materials to ensure they remain relevant to the digital context without neglecting fundamental Islamic values.

Pedagogical innovation through the use of digital technologies, such as mobile apps and virtual reality, holds great potential for enhancing the effectiveness of Islamic Education (PAI) instruction (Johariyah & Samsuddin, 2024). Furthermore, this requires teachers to adapt to teaching methods, media, and materials that align with technological advancements in order to inspire students' enthusiasm and motivation for learning (Ichsan, 2024). Optimizing the role of technology in Islamic Education is not limited to the delivery of content but also encompasses the development of students' character grounded in religious values amidst the overwhelming flow of digital information (Salmin et al., 2025; Yarun et al., 2023). Teachers' awareness is crucial for them to independently develop their competencies through various online learning resources, enabling them to effectively integrate Islamic Religious Education with digital technology (Habibah, 2022; Salmin et al., 2025). This integration includes the use of Learning Management Systems and instructional videos to enhance students' cognitive understanding of Islamic content and encourage the holistic practice of Islamic values (Salmin et al., 2025)

The adoption of innovative learning models, such as deep learning, can also serve as a significant strategy for enhancing students' understanding and preparing them to face increasingly complex global challenges (Putri, 2024). The use of artificial intelligence and adaptive learning systems also holds great potential for personalizing students' learning experiences, allowing them to explore Islamic concepts in a more in-depth and interactive manner (Santoso, 2025). This aligns with the need to develop integrated learning models that not only leverage digital technology but are also supported by comprehensive school policies in creating an interactive, collaborative, and spiritually enriching learning environment (Salmin et al., 2025). Optimizing the integration of digital technology in Islamic Education (PAI) requires adjusting teaching strategies to ensure the material remains relevant and engaging for students ((Salmin et al., 2025).

The use of interactive digital media, such as Islamic mobile apps and educational social media, can enhance cognitive understanding and encourage the internalization of Islamic values in students' daily lives (Salmin et al., 2025). This strategy requires strengthening the capacity of educators through training focused on learning methods based on religious moderation, where school principals play a crucial role in creating a

conducive learning environment (Tobondo, 2025). Support from parents and the community is also a crucial factor in the successful implementation of this learning model, given that in-depth education requires active involvement from various parties (Putri, 2024).

The importance of collaboration among teachers, students, parents, and the community aligns with recommendations to develop a specific and structured model of Islamic education management in order to foster religious moderation more effectively in schools (Tobondo, 2025). Furthermore, government support in providing infrastructure and teacher training is essential to ensure the equitable implementation of this learning model, even in remote areas, to overcome geographical and accessibility challenges (Putri, 2024). Nevertheless, the integration of advanced technologies such as artificial intelligence and adaptive systems into Islamic Education (PAI) learning still faces obstacles related to limitations in technological infrastructure and teacher readiness (Santoso, 2025). Therefore, collective efforts from various stakeholders are needed to provide adequate access to technology as well as ongoing training for teachers so they can optimize its use in PAI instruction (Putri, 2024; Santoso, 2025). The development of integrated, digital-based learning models which are not only informative but also holistically instill Islamic values is crucial for addressing these challenges (Salmin et al., 2025). The implications of this approach highlight the urgency of training Islamic Education teachers in the use of digital technology, as well as the need for school policies to support the creation of a religious learning ecosystem that is adaptable to technological advancements (Salmin et al., 2025)

Aligning the Islamic Education curriculum with the needs of the digital age, where universal Islamic values are integrated contextually, is also a key prerequisite for producing students with a broad perspective on diversity and who are prepared to face global challenges (Tobondo, 2025). This approach underscores the importance of inclusive curricula and teaching methods, as well as enhancing teachers' multicultural competencies to foster tolerant understanding within a multicultural society (Vu et al., 2025; Yasin & Rahmadian, 2024).

Thus, strategies for developing the pedagogical competencies of Islamic Education teachers in the digital age must encompass not only the technical aspects of device usage but also the reinforcement of understanding regarding digital ethics, religious moderation, and the ability to adapt learning content to remain relevant to contemporary contexts and Islamic values (Abdiyantoro et al., 2023; Aulia & Zuzano, 2025). Therefore, a holistic approach is needed that prioritizes the cognitive, affective, and behavioral aspects of students so that they can apply the values of moderation in daily life through Islamic Religious Education (Tobondo, 2025). Improving religious understanding among Islamic Religious Education teachers and general subject teachers is also crucial because they often acquire religious understanding through self-study, which may be unstructured and inconsistent with the principles of religious moderation (Hidayat et al., 2023).

Despite this growing body of literature, a critical research gap remains: there is insufficient synthesis of how PAI teachers can simultaneously develop digital pedagogical competencies while maintaining the integrity of Islamic values in their teaching practice. Previous studies have tended to address either the technological or the religious dimension in isolation, without providing an integrated framework that bridges both aspects. Furthermore, existing reviews rarely encompass the full range of

relevant themes from curriculum design and pedagogical innovation to AI integration and teacher professional development within a single, cohesive analysis. This systematic literature review therefore aims to fill that gap by offering a comprehensive and integrated perspective on the development of PAI teachers' pedagogical competencies in the digital age.

B. METHOD

This study uses a systematic review approach based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology (Page et al., 2021). This approach allows for a comprehensive synthesis of existing empirical evidence in a transparent and replicable manner.

In conducting this systematic review, clear inclusion and exclusion criteria were established to ensure the relevance and quality of the selected studies. Only studies that directly address the development of pedagogical competence within the context of Islamic Religious Education and digital learning environments were included. The criteria are presented in Table I.

Table I. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Population	Islamic Religious Education teachers (PAI teachers)	Students, non-education professionals
Variable	Pedagogical competence, digital competence, technology integration	Studies not related to pedagogical competence
Outcome	Development, improvement, or effectiveness of pedagogical competence in the digital age	No discussion of pedagogical outcomes
Design	Empirical studies (quantitative, qualitative, mixed methods)	Opinions, editorials, conceptual papers without data
Publications	Peer-reviewed English/Indonesian journals,	Non-peer-reviewed, abstract only
Time	2015–2025 (digital era relevance)	Before 2015

These criteria ensure that only high-quality and relevant empirical studies are included in the review, thereby strengthening the validity and reliability of the findings.

The literature search was conducted using major academic databases, including Google Scholar, Scopus, and ERIC. The search strategy employed combinations of keywords derived from key concepts such as Pedagogical Competence, Islamic Education, and Digital Literacy. The specific keywords used in the search process included “pedagogical competence”, “Islamic religious education teacher”, “digital learning”, “technology integration”, and “teacher professional development”.

For the purposes of this review, “pedagogical competence” was operationally defined as the capacity of PAI teachers to plan, implement, and evaluate learning activities in a manner that is contextually responsive, student-centered, and aligned with both educational technology advancements and Islamic values. This definition guided the categorization of findings across four analytical dimensions: (1) curriculum design and transformation, (2) pedagogical approaches and innovation, (3) digital technology integration, and (4) the reinforcement of Islamic values in digital learning

contexts. Studies were coded and mapped against these dimensions during the data extraction phase.

The data analysis process followed several systematic stages. First, studies were identified through database searching. Second, titles and abstracts were screened to eliminate irrelevant studies. Third, full-text articles were assessed based on the established eligibility criteria. Fourth, relevant data were extracted and organized into analytical categories. Finally, thematic analysis was conducted to identify key patterns, trends, and gaps in the literature, followed by an evaluation of the methodological quality of the selected studies. This structured process ensures that the review findings are both rigorous and comprehensive.

C. RESULT AND DISCUSSION

Result

The results of a systematic literature review indicate that the development of pedagogical competencies among Islamic Religious Education (PAI) teachers in the digital age is influenced by several key aspects, namely curriculum design, pedagogical approaches, technology integration, and the reinforcement of Islamic values. From a curriculum perspective, a futuristic PAI curriculum design emphasizes the strengthening of cognitive aspects integrated with Islamic values to address the challenges of the digital age (Arrosyid & Purwaningtyas, 2021). This approach emphasizes a balance between the use of modern technology and the preservation of religious values, thereby creating a holistic learning experience encompassing cognitive, affective, and psychomotor aspects (Santoso, 2025).

The implementation of this curriculum is supported by the Kurikulum Merdeka policy, which provides flexibility for teachers in designing contextual and student-centered learning (Sukari & Hasan, 2025). This flexibility enables the integration of religious moderation into PAI instruction to foster students' tolerant and inclusive character (Azis, 2024). Additionally, PAI instruction plays a role in instilling the value of tolerance from an early age through relevant learning strategies (Nurcholis, 2024)

From a pedagogical perspective, the implementation of innovative learning models such as discovery learning, deep learning, and gamification has been shown to increase student engagement and understanding. The discovery learning approach encourages students to actively construct knowledge, while deep learning emphasizes a deep and contextual understanding of the learning material (Suwandi et al., 2024). Meanwhile, gamification has been shown to significantly increase students' interest in learning (Tobondo & Tondowala, 2024).

The integration of digital technology, including artificial intelligence (AI), enables personalized learning, real-time feedback, and broad access to learning resources (Lestari et al., 2023). However, there are several challenges in its implementation, such as limited technological infrastructure, low digital literacy, and teachers' readiness to adopt learning technologies (Putri, 2024).

Based on these overall findings, the synthesis of the research results can be summarized as follows.

Table II. Synthesis of Research Findings

Aspect	Findings	Impact
Curriculum	Futuristic curriculum & Kurikulum Merdeka	Flexible and contextualized learning
Pedagogy	Discovery learning, deep learning, gamification	Increased student engagement and understanding
Values	Religious moderation	Promotes tolerance and inclusivity
Technology	Artificial Intelligence & digital learning	Personalized and effective learning
Teachers	Continuous professional development	Improved pedagogical competence
Challenges	Infrastructure limitations & teacher readiness	Barriers to effective implementation

Discussion

The findings of this study indicate that the development of pedagogical competencies among Islamic Education teachers in the digital age is a complex and multidimensional process, involving the integration of curriculum, pedagogical approaches, technology, and Islamic values. The flexibility of the Merdeka Curriculum serves as a crucial foundation for fostering more adaptive and contextual learning transformations (Sukari & Hasan, 2025). This curriculum provides space for teachers to develop learning experiences that are not only oriented toward knowledge transfer but also toward strengthening character and 21st-century competencies. This aligns with the constructivist approach, which emphasizes active and meaningful learning, where students act as active participants in the learning process ((Syamsuriah et al., 2025).

Furthermore, the implementation of innovative learning models such as discovery learning, deep learning, and gamification has been shown to significantly contribute to increased student engagement and understanding (Putri, 2024; Susanti & Purwandari, 2024). The deep learning approach allows students to understand the material in a more reflective and contextual manner, enabling them to connect Islamic values with daily life (Aliyah & Norlianti, 2025). Meanwhile, gamification plays a role in enhancing learning motivation through a more interactive and enjoyable approach (Tobondo & Tondowala, 2024). These findings confirm that pedagogical innovation is a key factor in improving the quality of Islamic Education (PAI) in the digital age.

However, the effectiveness of such pedagogical approaches depends heavily on teachers' readiness and competence. Islamic Education teachers are not only required to master the subject matter but must also possess the ability to design innovative, technology-based learning strategies. In this context, teachers' professional development through ongoing training becomes crucial (Suharyo et al., 2024). Furthermore, low digital literacy among teachers remains a major challenge in the implementation of technology-based learning (Rosmaini, 2025; Turnando et al., 2025). This indicates that enhancing pedagogical competencies must be accompanied by strengthening digital competencies as part of educational needs in the digital age.

The integration of digital technology, particularly artificial intelligence (AI), offers significant opportunities to enhance the quality of learning through personalization and efficiency (Hastuti & Hartono, 2024; Susanti & Purwandari, 2024). AI enables teachers to tailor instruction to individual student needs and provide real-

time feedback (F. Hakim et al., 2024). Furthermore, the use of AI can also reduce teachers' administrative workload, allowing them to focus more on meaningful learning interactions ((A. Hakim & Anggraini, 2023). However, the implementation of AI also raises ethical challenges, particularly regarding the potential erosion of spiritual values and a shift in the objectives of religious education ((Noor et al., 2025).

Therefore, the use of AI in Islamic Education must be based on a strong ethical framework and aligned with Islamic principles, such as justice, responsibility, and information security (F. Hakim et al., 2024; Rofi'i, 2023). Furthermore, integrating Islamic values into the use of technology is crucial to maintaining a balance between innovation and spirituality (Johariyah & Samsuddin, 2024). This approach emphasizes that technology should not replace the teacher's role as a moral guide but must function as a tool to strengthen character-building-oriented learning processes.

On the other hand, structural challenges such as limited digital infrastructure and the digital divide remain major obstacles in the implementation of AI-based learning, particularly in remote areas (Ng et al., 2021; Putri, 2024). These limitations include access to technological devices, internet connectivity, and the readiness of educational institutions to adopt digital innovations. Therefore, comprehensive policy support is needed, including investment in digital infrastructure and strengthening human resource capacity (Baharuddin et al., 2025; Turnando et al., 2025).

Furthermore, the development of a curriculum that integrates AI and a technoscience approach is a strategic step in addressing educational challenges in the digital age (Hastuti & Hartono, 2024; Siswanto, 2025). However, the implementation of such a curriculum must remain grounded in Islamic values and local wisdom to avoid eroding the identity of religious education (Achruh et al., 2024). This indicates that the transformation of Islamic education in the digital age requires a balanced approach between technological innovation and the preservation of traditional values.

When compared with studies on digital pedagogy in non-religious educational contexts, several distinctive patterns emerge in the Islamic education setting. In general education, technology integration primarily focuses on cognitive outcomes and competency-based skill development (Ng et al., 2021). By contrast, PAI instruction must simultaneously address the affective and spiritual dimensions of learning, requiring teachers to exercise heightened pedagogical judgment in selecting and implementing digital tools that align with Islamic moral frameworks. This dual obligation to be technologically proficient and spiritually grounded represents a unique challenge for PAI teachers that has no direct equivalent in secular digital pedagogy. Furthermore, while digital divide issues are well-documented in general education globally, the intersecting challenges of infrastructure limitations and the expectation to preserve religious authenticity in digital environments create a compounded barrier specific to Islamic education contexts, particularly in under-resourced regions of Indonesia. To address infrastructure limitations specifically, concrete strategies include government-funded device lending programs, offline capable learning management systems, community-based digital hubs, and peer mentoring networks among teachers. To tackle low digital literacy, structured training programs using a scaffolded approach beginning with basic digital tools and gradually advancing to AI-based platforms are recommended, alongside the development of PAI specific digital teaching modules that integrate Islamic ethics into technology use from the outset.

Overall, the findings of this study confirm that the development of PAI teachers' pedagogical competencies in the digital age requires a holistic and integrative approach. The integration of a flexible curriculum, innovative pedagogy, digital technology, and Islamic values is key to creating relevant and meaningful learning. Thus, Islamic Education teachers in the digital age are required to be adaptive, reflective, and professional educators in facing the dynamics of technological development and the needs of students.

CONCLUSION

The use of artificial intelligence (AI) in Islamic Religious Education (PAI) demonstrates significant potential for improving the quality of learning through personalization, interactivity, and efficiency. This technology enables teachers to identify students' learning needs more precisely, tailor instructional strategies, and provide rapid and accurate feedback. Furthermore, AI also helps reduce teachers' administrative workload, allowing them to focus more on meaningful pedagogical interactions. However, the implementation of AI also presents serious challenges, particularly regarding the potential erosion of spiritual values and a shift in the essence of religious education if not integrated wisely.

The implications of these findings underscore that the development of Islamic Education teachers' pedagogical competencies in the digital age must be approached holistically, integrating technological, pedagogical, and Islamic values. In this context, the Merdeka Curriculum serves as a strategic framework that can support technology-based learning innovations, including the integration of AI. Furthermore, enhancing teachers' digital competencies through continuous training is crucial to ensure their readiness to adopt technology effectively. The development of adaptive curricula and the creation of an educational ecosystem that supports innovation are also key to optimizing the use of AI in PAI instruction.

Furthermore, the use of AI in Islamic education requires a robust ethical framework to ensure it remains aligned with the principles of Islamic teachings. Technology must be used as a means to reinforce Islamic values, not as a factor that erodes them. Therefore, principles such as justice, accountability, transparency, and data security must form the foundation for AI implementation. On the other hand, challenges such as limited digital infrastructure, the digital divide, and low digital literacy among teachers highlight the need for comprehensive policy support, including investment in infrastructure and capacity building for human resources.

Based on these findings, several practical recommendations are offered for key stakeholders. For policymakers, national digital competency standards for PAI teacher education programs should be established, alongside dedicated funding for digital infrastructure in Islamic schools, particularly in underserved regions. For educators and school principals, collaborative professional learning communities centered on digital pedagogy and Islamic values integration should be cultivated, with regular reflection on the ethical dimensions of classroom technology use. For curriculum designers, the development of PAI-specific digital learning modules embedding Islamic ethical principles is strongly encouraged, with explicit curriculum guidance on technology integration rather than leaving it to individual discretion. For teacher training

institutions, pre-service and in-service programs should incorporate practical training in AI-assisted tools, digital literacy, gamification, and discovery learning within an Islamic educational framework.

Several areas warrant further investigation: (1) longitudinal studies to assess the long-term impact of AI and digital technology on student learning outcomes and Islamic values preservation; (2) comparative studies across regional and institutional contexts to identify the most effective implementation models in under-resourced versus well-equipped settings; (3) experimental or quasi-experimental research to strengthen the evidence base, which currently remains predominantly qualitative; (4) exploration of students', parents', and communities' perspectives on the acceptability and effectiveness of technology-enhanced PAI learning; and (5) development and validation of a comprehensive pedagogical competency framework specifically designed for PAI teachers in the digital age, serving as a tool for evaluation, professional development, and curriculum design.

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