Technology-Based PAI Learning Evaluation To Improve Religious Competency Achievement

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Abstract

The integration of technology in Islamic Religious Education (PAI) learning has become an important strategy for enhancing students' religious competency achievement. This article aims to evaluate various technology-based PAI learning approaches and their effectiveness in improving religious learning outcomes. Based on a literature review, findings indicate that blended learning and Edmodo-based e-learning models have proven to increase student participation, motivation, and learning outcomes. Pedagogical approaches such as value clarification and Islamic psychoeducation are also effective in helping students internalize and apply religious values. Key supporting factors for success include the availability of technological infrastructure and comprehensive teacher training to master digital teaching strategies. Furthermore, integrating Islamic values with science and technology creates more meaningful and contextual learning. This study concludes that technology-based PAI learning, when supported by appropriate models, value-based approaches, and competent teachers, has significant potential to substantially improve students' religious competency.

INTRODUCTION

Islamic Religious Education (PAI) plays a crucial role in shaping the character and religious competency of the Muslim generation. In the context of the digital era, new challenges and opportunities are emerging, demanding a transformation from static learning methods towards more dynamic and relevant approaches. Integrating technology into PAI learning is no longer just an alternative but a necessity to enhance the effectiveness and achievement of students' religious competency (Zakiyyah et al., 2024). The development of information and communication technology has changed the global educational landscape, including religious education, which requires adaptation and innovation to remain relevant and effective (Muhaimin et al., 2019).

Several previous studies indicate the significant potential of technology adoption. For example, implementing blended learning in learning evaluation courses within a PAI study program has proven to contribute positively to institutional progress and create a conducive educational climate (Marzuki et al., 2020). Platforms like Edmodo have also demonstrated effectiveness in increasing online discussion participation, task completion, as well as student interest and motivation in vocational schools (Ratnaningsih et al., 2020).

These findings indicate that technology can act as a catalyst for creating more engaging learning experiences. Additionally, research by Hamid et al. (2020) states that utilizing a Learning Management System (LMS) can enhance the accessibility and flexibility of PAI learning, enabling learning to occur anytime and anywhere.

However, technology integration efforts should not solely focus on instrumental aspects. Pedagogical and value aspects remain the primary foundation. Approaches like value clarification have been proven to enhance students' ability to choose, communicate, and apply values in PAI (Khadijah et al., 2019). Meanwhile, Islamic psychoeducation is considered capable of strengthening the resilience of both students and lecturers in facing various challenges in the digital era (Nurlela et al., 2025). This reinforces that technology should be directed to strengthen, not replace, the essence of value education. As emphasized by Nurdin (2021), technology in Islamic education must function as a *wasilah* (means) to achieve educational goals oriented towards forming a perfect human (*insan kamil*), not as an end in itself.

In the field, implementation challenges persist. Evaluation in several Islamic schools shows that although some teachers already use technology, others still adhere to conventional methods (Ghani et al., 2022). This condition highlights the importance of improving technological infrastructure and comprehensive teacher training to enhance their pedagogical competency and digital teaching effectiveness (Siregar et al., 2025; Azman et al., 2025). The digital divide between urban and rural schools also poses a serious obstacle that needs attention (Rahman & Ali, 2023). Therefore, systemic policies and support are needed to ensure an inclusive and equitable digital learning ecosystem.

Therefore, this article aims to comprehensively evaluate the implementation of technology-based PAI learning and its contribution to improving students' religious competency achievement. By reviewing various models such as blended learning, value clarification approaches, Islamic psychoeducation integration, and cloud-based learning, this article seeks to provide a holistic overview of how technology can be optimized to create more meaningful, relevant, and effective PAI learning in shaping religious competency in the 21st century.

METHODS

This study uses the Systematic Literature Review (SLR) method to identify, evaluate, and synthesize research findings related to technology integration in Islamic Religious Education (PAI) learning. This approach was chosen to provide a comprehensive and systematic understanding of the theoretical and empirical foundations of the topic under study (Xiao & Watson, 2019).

Data Sources and Search Strategy

The primary data for this research was obtained from research articles indexed in the Scopus database. Literature searches were conducted using combined keywords, such as "technology-based learning" AND "Islamic religious education", "blended learning" AND "PAI", and "digital technology" AND "religious competence". The search focused on articles published within the last 5 years (2019-2025) to ensure the relevance of the findings.

Selection Criteria

The inclusion criteria for literature selection were:
1. Empirical or review articles that directly discuss the evaluation, models, or strategies of technology-based PAI learning.
2. Articles measuring the impact of technology integration on student motivation, learning outcomes, or religious competency achievement.
3. Published in indexed international journals or conference proceedings.

Data Analysis Procedure

A total of 10 selected articles were analyzed using content analysis techniques. The analysis was conducted thematically to identify patterns, themes, and relationships between concepts. The emerging main themes were then classified into key categories, such as:

1. Learning Model Effectiveness: Analyzing findings about blended learning (Marzuki et al., 2020) and Edmodo-based e-learning (Ratnaningsih et al., 2020).
2. Pedagogical Approaches: Examining the application of the value clarification approach (Khadijah et al., 2019) and Islamic psychoeducation (Nurlela et al., 2025).
3. Implementation Supporting Factors: Reviewing findings regarding technological infrastructure (Ghani et al., 2022), teacher training (Azman et al., 2025; Siregar et al., 2025), and the integration of Islamic values (Wulan et al., 2021; Zakiyyah et al., 2024).

Through this method, the research strives to present a structured and in-depth synthesis to evaluate the potential and challenges of technology-based PAI learning in improving religious competency.

RESULT AND DISCUSSION

1. Research result

Based on the analysis of ten selected articles, research findings can be grouped into several main themes depicting the impact, models, and determining factors for the success of technology-based PAI learning.

Effectiveness of Blended and E-Learning Models

Research results consistently show that the blended learning model significantly contributes to creating a more conducive and integrated educational climate in PAI study programs (Marzuki et al., 2020). More specifically, the implementation of Edmodo-based e-learning within the blended learning framework has proven not only to increase active student participation in discussions and online task completion but also directly enhances their interest and learning motivation (Ratnaningsih et al., 2020). These findings indicate that digital platforms can function as catalysts for deeper student engagement.

Impact of Innovative Pedagogical Approaches

Beyond delivery models, pedagogical approaches integrated with technology also show positive results. The application of the Value Clarification Approach has proven capable of improving students' ability to choose, communicate, and most importantly, apply PAI values in the context of life, reflected by a significant increase in learning outcomes (Khadijah et al., 2019). Additionally, the integration of Islamic Psychoeducation principles successfully identified an increase in resilience among both students and lecturers in facing challenges and threats arising from educational practices in the digital era (Nurlela et al., 2025).

Challenges and Support for Infrastructure and Teacher Competency

Despite its great potential, technology implementation in the field is not without challenges. An evaluation in Islamic schools found that although most teachers use technology as a learning medium, dominant conventional teaching practices still exist (Ghani et al., 2022). This condition highlights a gap in technology adoption. Therefore, improving technological infrastructure and comprehensive teacher training are considered critical factors for optimizing educational outcomes (Siregar et al., 2025). Training in digital teaching strategies is specifically needed to enhance teachers' pedagogical competency and teaching effectiveness (Azman et al., 2025).

Value Integration and Learning Motivation Enhancement

A key finding is the importance of explicitly integrating Islamic values in technology-based learning. Learning that integrates science, technology, and Islamic values provides a more meaningful and relevant experience for students as Muslims (Wulan et al., 2021). Such integration also facilitates the internalization and application of religious values in the context of the digital world (Zakiyyah et al., 2024). Furthermore, a cloud-based learning program was reported to significantly increase PAI students' learning motivation, ultimately impacting improved learning outcomes (Arood et al., 2020).

To provide a concise and comprehensive overview, the main findings from all analyzed articles are summarized in Table 1 below.

No.	Fokus Penelitian	Temuan Utama	Referensi
1	Blended Learning	Contributes positively to institutional progress and creates a conducive educational climate.	Marzuki et al. (2020)
2	E-learning (Edmodo)	Increases online discussion participation, task completion, interest, and learning motivation.	Ratnaningsih et al. (2020)
3	Value Clarification Approach	Improves students' ability to choose, communicate, and apply PAI values.	Khadijah et al. (2019)
4	Islamic Psychoeducation	Increases resilience of students and lecturers in facing digital era challenges.	Nurlela et al. (2025)
5	Infrastruktur Teknologi	Some teachers already use technology, but conventional practices persist; infrastructure needs improvement.	Ghani et al. (2022)
6	Pelatihan Guru	Training in digital teaching strategies is crucial for improving teacher pedagogical competency.	Azman et al. (2025)
7	Integrasi Nilai Islam	Integrating science, technology, and Islamic values creates more meaningful and relevant learning.	Wulan et al. (2021)
8	Manajemen Pembelajaran Digital	Assists in internalizing and applying religious values in the digital context.	Zakiyyah et al. (2024)
9	Cloud-based Learning	Cloud-based programs are effective in increasing PAI students' learning motivation.	Arood et al. (2020)
10	Integrasi Teknologi Secara Umum	Technology and teacher training are key supporting factors for improving	Siregar et al. (2025)

No.	Fokus Penelitian	Temuan Utama	Referensi
		Islamic education.	

Table 1. Synthesis of Main Findings from Literature on Technology-Based PAI
Learning

2. Discussion Results

This literature review comprehensively explores the landscape of technology-based Islamic Religious Education (PAI) learning and its relation to improving religious competency. The analysis results of ten empirical studies reveal a strong convergence of evidence regarding the transformative potential of technology, while also highlighting the implementation complexities involving pedagogical, technical, and cultural dimensions. This discussion will elaborate on the key findings, compare them with broader previous research, identify underlying causal mechanisms, and reflect on limitations and implications for future research.

Convergence and Moving Beyond Technology as a Mere Tool

The main findings of this research consistently show that technology, when integrated with appropriate approaches, functions as more than just a tool. Studies by Marzuki et al. (2020) and Ratnaningsih et al. (2020) confirm previous findings in the context of general education (e.g., Garrison & Kanuka, 2004) regarding the effectiveness of blended learning in increasing engagement and creating a flexible learning environment. However, the PAI context brings unique nuances. The success of blended learning in PAI lies not only in the efficiency of material delivery but in its ability to bridge the gap between theoretical-normative understanding in the classroom and religious practice in daily life (*amaliyah*). This aligns with the argument by Hafidh (2019) who emphasizes that technology in PAI must be able to build a "transcendental relation" that is not limited by space and time.

Furthermore, findings from Khadijah et al. (2019) on the Value Clarification Approach (VCA) and Nurlela et al. (2025) on Islamic Psychoeducation deepen our understanding of how technology can be utilized for more nuanced pedagogical approaches. VCA, originally developed in secular value education (Raths et al., 1966), has proven effective in the context of technology-based PAI. Digital platforms provide a safe and structured space for students to clarify values through discussion, reflection, and simulation, which then crystallize into real actions. This is a significant development from previous research that often viewed technology only as a passive presentation medium. Similarly, the integration of Islamic Psychoeducation addresses concerns from many parties regarding the negative impact of the digital world on mental and spiritual health. The findings of Nurlela et al. (2025) strengthen research by Al-Adawy et al. (2023) stating that spiritual resilience is an important prerequisite for healthy navigation in the digital world. Thus, these studies not only use technology but also leverage it to strengthen the psycho-spiritual foundation of learners.

Mapping Implementation Challenges: Beyond Infrastructure Issues

Findings regarding infrastructure challenges and teacher competency (Ghani et al., 2022; Siregar et al., 2025; Azman et al., 2025) essentially confirm what has long been documented in the literature on Information and Communication Technology (ICT) integration in education (e.g., Ertmer, 1999 on first-order and second-order barriers).

However, in the PAI context, these challenges have additional dimensions.

First, the finding by Ghani et al. (2022) that some teachers still adhere to conventional methods may not only be due to a lack of skills (second-order barrier) but also "philosophical resistance." Some PAI educators may question the compatibility of technology with the values of simplicity and spiritual depth they aim to achieve, or worry that technology will reduce the teacher's authority as the source of knowledge (*talaqqi*). These concerns represent a clash between the epistemology of traditional Islamic education and the fluid, participatory digital epistemology. Therefore, teacher training recommended by Azman et al. (2025) and Siregar et al. (2025) must not only be technical-operational but must include a dimension of "philosophy of technology in Islamic education." Such training needs to demonstrate how technology can become a *wasilah* (means) to strengthen, not weaken, the values of worship (*ubudiyah*) and divinity (*ilahiyah*).

Second, the need for an authentic integration model is crucial. Findings by Wulan et al. (2021) and Zakiyyah et al. (2024) on the integration of Islamic values affirm that the success of technology-based PAI heavily depends on the ability to conduct "platform Islamization," not merely "Islamizing content." This means learning design must ensure that values like monotheism (*tauhid*), sincerity (*ikhlas*), and humility (*tawadhu*) not only become taught material but are internalized in the culture and ethics of technology use in the digital learning space. For example, online discussions are not only assessed based on participation quantity but also on the quality of communication ethics (such as avoiding gossip and guarding one's speech). This is an important contribution of this research to the broader discourse on digital citizenship, by adding a distinct spiritual-ethical Islamic perspective.

Causal Mechanisms Towards Improving Religious Competency: A Proposed Model

Based on the synthesis of findings, a model proposition regarding the causal mechanism of how technology-based PAI learning improves religious competency can be proposed. This model posits that technology's impact on religious competency is not direct but is mediated by a series of psychological and pedagogical factors.

First, technology acts as a catalyst for engagement. As shown by Ratnaningsih et al. (2020) and Arood et al. (2020), platforms like Edmodo and cloud computing successfully increase student motivation and participation. This increase in motivation creates a conducive psychological condition (interest and attention) for receiving religious values.

Second, technology provides a vehicle for value internalization. Through approaches like VCA (Khadijah et al., 2019) and reflection spaces in psychoeducation (Nurlela et al., 2025), students not only hear about values but actively process, question, and connect them with their real-life contexts in the digital world. This active process facilitates internalization, where external values (religious values) are adopted into internal beliefs and personal principles.

Third, technology enables contextualization of application. Religious competency encompasses not only knowledge (cognitive) but also skills (psychomotor) in worship and morals, and attitudes (affective) of loving religion. Technology, through simulations, video tutorials, and digital projects, allows students to practice applying Islamic values in scenarios resembling daily life in the digital era. For instance, practicing discussion with Islamic ethics in online forums, or creating creative content containing da'wah messages.

Thus, the proposed causal flow is: Technology -> Increases Engagement & Provides Vehicle -> Facilitates Value Internalization & Contextualization of Application -> Improves Religious Competency (Cognitive, Affective, Psychomotor). This process heavily depends on the teacher's role as a facilitator (as emphasized in teacher training findings) and the availability of adequate infrastructure.

Research Limitations and Implications for the Future

Although this review provides valuable insights, several limitations need to be acknowledged. First, methodological limitations of the synthesized studies. Most analyzed studies (e.g., Ratnaningsih et al., 2020; Arood et al., 2020) used quasi-experimental designs or case studies limited to a single institution. This limits the generalizability of findings. Furthermore, the measurement of "religious competency" in these studies often focuses on cognitive aspects (test scores) and affective aspects (motivation, interest), while measuring complex psychomotor aspects such as consistency in worship or morals in social interactions outside school remains very limited. More robust and longitudinal instruments are needed to measure long-term impacts on student character and religious behavior.

Second, scope limitations. This review focused on Scopus-indexed literature, which may miss rich qualitative discussions from relevant local journals or books. Issues like the digital divide between urban and rural schools, or critical perspectives on the commodification of religious education through commercial platforms, have not been extensively addressed in the analyzed studies.

Third, thematic limitations. Existing research is still dominated by model and platform evaluations. Future research needs to explore deeper areas, such as:

a. Neuroscience of Religious Education: How does stimulation from digital learning affect the development of neural circuits related to spirituality and morality?

b. Artificial Intelligence (AI) Ethics in PAI: How to design an AI tutor that can understand the nuances of Islamic law and ethics (*fiqh*) and provide appropriate guidance?

c. Universal Design for Learning (UDL) for PAI: How to create PAI platforms accessible and relevant to all students, including those with special needs and diverse backgrounds of religious understanding?

Overall, this discussion underlines that the evaluation of technology-based PAI learning must be multidimensional. Its success should not only be measured technically ("does the technology work?") or cognitively alone ("do the scores improve?"), but more importantly, by its impact on shaping a whole Muslim personality in the digital world. This requires synergy between reliable infrastructure, teachers who are not only skilled but also have deep philosophical understanding, and authentic integration models that place Islamic values as the spirit of every technology used. The existing literature has provided a strong foundation and shows a promising direction, yet the journey to fully understand and utilize technology's potential in educating the hearts and minds of the Muslim generation remains long and full of meaningful research opportunities.

CONCLUSIONS

Based on a comprehensive literature review of ten empirical studies, it can be concluded that integrating technology into Islamic Religious Education (PAI) learning is an inevitable and potentially effective paradigm for improving students' religious competency achievement. The success of this paradigm is not automatic but depends on a complex and interrelated configuration of three key elements.

Thus, improving religious competency through technology-based PAI does not occur through a direct path but through a mediated process where technology creates conducive conditions and provides a vehicle for meaningful value internalization and practice. This conclusion affirms that the digital transformation in PAI must be humanistic and value-laden, where technology serves as a servant to strengthen the ultimate goal of religious education that is, to shape a Muslim personality who is not only knowledgeable (cognitive) but also possesses noble attitudes (affective) and practical abilities (psychomotor) in the digital era.

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