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BETWEEN HUMANS AND RELIGIOUS VALUES (COLLABORATION IN AI-BASED ISLAMIC RELIGIOUS EDUCATION LEARNING)

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Abstract

This study is motivated by the rapid advancement of digital technologies, particularly Artificial Intelligence (AI), which has become a central topic in contemporary educational development. This research aims to examine the role of AI in post-pandemic Islamic Religious Education (Pendidikan Agama Islam/PAI) by assessing students' satisfaction with AI-assisted learning. The PIECES framework—encompassing Performance, Information and Data, Economics, Control and Security, Efficiency, and Service—was employed to evaluate six key dimensions of system use. A total of 61 PAI students participated in this study through a Likert-scale questionnaire. The findings show that students generally express satisfied perceptions toward the implementation of AI in PAI

learning, with most domains falling within the satisfied category and the Performance domain showing a neutral response. These results indicate that AI contributes to improving access to learning resources, supporting learning autonomy, enhancing efficiency, and facilitating more interactive learning experiences. Furthermore, the integration of AI was perceived to remain compatible with ethical and spiritual values in Islamic education when applied responsibly. The novelty of this study lies in its application of the PIECES framework within the context of Islamic Religious Education, providing an empirical model for evaluating the acceptance and effectiveness of AI-assisted learning in post-pandemic higher education. This research offers theoretical and practical insights into how AI can be responsibly integrated into religious education to strengthen learning quality, digital adaptability, and student engagement.

Keywords: *AI-Assisted Learning, Digital Transformation, Islamic Education, Student Satisfaction, PIECES Framework.*

Abstrak

Penelitian ini dilatarbelakangi oleh pesatnya perkembangan teknologi digital, khususnya Artificial Intelligence (AI), yang semakin banyak dimanfaatkan dalam dunia pendidikan. Penelitian ini bertujuan menganalisis peran AI dalam pembelajaran Pendidikan Agama Islam (PAI) pada periode pascapandemi melalui penilaian tingkat kepuasan mahasiswa terhadap penggunaan AI dalam proses pembelajaran. Kerangka PIECES—meliputi aspek Kinerja, Informasi dan Data, Ekonomi, Kontrol dan Keamanan, Efisiensi, serta Layanan—digunakan untuk mengevaluasi enam dimensi utama penggunaan sistem. Sebanyak 61 mahasiswa PAI berpartisipasi dengan mengisi kuesioner berskala Likert. Hasil penelitian menunjukkan bahwa mahasiswa secara umum memberikan persepsi puas terhadap penerapan AI dalam pembelajaran PAI, dengan sebagian besar domain berada pada kategori puas dan domain Kinerja berada pada kategori netral. Temuan ini mengindikasikan bahwa

AI berkontribusi dalam meningkatkan akses informasi, mendukung kemandirian belajar, meningkatkan efisiensi, serta memperkuat interaktivitas dalam proses pembelajaran. Selain itu, mahasiswa menilai bahwa penggunaan AI tetap dapat selaras dengan nilai-nilai etika dan spiritual dalam pendidikan Islam apabila diterapkan secara bertanggung jawab. Kebaruan penelitian ini terletak pada penerapan kerangka PIECES dalam konteks pembelajaran PAI, sehingga menghasilkan model evaluatif empiris untuk menilai tingkat penerimaan dan efektivitas pembelajaran berbantuan AI di perguruan tinggi pascapandemi. Penelitian ini memberikan wawasan teoretis dan praktis mengenai bagaimana AI dapat diintegrasikan secara bertanggung jawab dalam pendidikan agama guna meningkatkan kualitas pembelajaran, adaptabilitas digital, dan keterlibatan mahasiswa.

Kata Kunci: *Pembelajaran Berbasis AI, Transformasi Digital, Pendidikan Agama Islam, Kepuasan Mahasiswa, Metode PIECES.*

INTRODUCTION

One of the impacts of the COVID-19 pandemic was the significant increase in the use of online learning media, which facilitated the process of acquiring knowledge through distance learning (Sari and Nurmiati 2021, 308). The pandemic that began in 2019 brought many changes, particularly in the education sector. Learning activities that were previously conducted face-to-face in classrooms have become more flexible and can now be carried out from various locations. Even after the pandemic ended, online or distance learning remains widely used. For lecturers with demanding schedules who are unable to attend in-person classes, online learning has become an alternative solution to ensure that the teaching and learning process continues effectively.

Entering the era of Society 5.0, various new challenges have emerged in human life, including in the field of education. Therefore, more innovative learning models and adequate technological support are required to facilitate effective learning

(Rahmawan 2021, 40). In this context, educators and students must be able to utilize digital technology in the process of teaching and learning Islamic Religious Education (PAI). In the modern era, failure to optimally integrate science and technology into education will result in stagnation and decline. It is undeniable that, in the future, humans will increasingly depend on technology in nearly all aspects of life.

In several developed regions such as Europe and Japan, lifestyle models that integrate individuals with technology are being actively developed. One of the most advanced technologies introduced is Artificial Intelligence (AI), which provides both convenience and challenges for its users. It is essential to understand the positive developments of this technology, especially in the field of education, to ensure that the learning process becomes easier, faster, and more efficient. This effort aims to develop competent learners who are well-prepared for the demands of the modern era. In the long term, it is expected that the quality of education in Indonesia will be able to compete with countries that are leaders in technological innovation (Muchamad et al. 2020, 56).

This research focuses on analyzing the role of Artificial Intelligence (AI) in Islamic Religious Education (PAI) learning in the post-pandemic period by employing the PIECES framework to measure student satisfaction levels. Previous research conducted by (Mulianingsih et al. 2020, 152), entitled "Artificial Intelligence and the Formation of Values and Character in Education," emphasized the role of AI in developing students' character and values within general educational contexts. Their findings showed that AI contributed to improving students' critical thinking skills and providing new learning perspectives

Unlike previous studies, this research specifically focuses on the application of AI in Islamic Religious Education (PAI) at the university level, particularly in the post-pandemic era. The scope of this research lies in measuring student satisfaction with the effectiveness of AI in PAI learning using the PIECES approach.

Thus, the position of this study is to provide empirical contributions to the integration of artificial intelligence technology in value-based Islamic learning while reaffirming AI's relevance in improving the efficiency, interactivity, and quality of education in the digital age. (Mulianingsih et al. 2020, 152).

Several prior studies, such as Supriadi et al. (2022) in "Technology-Based Learning Innovation Using Artificial Intelligence in Education in the Era of Industry 4.0 and Society 5.0," emphasized that the implementation of AI in education facilitates learning, promotes student independence, and reduces excessive dependence on teachers. However, that study primarily focused on general learning innovation and did not specifically examine its implementation in the context of Islamic Religious Education (PAI) (Supriadi et al. 2022, 197).

Based on the research objectives, the novelty of this study lies in applying the PIECES framework to analyze the role of Artificial Intelligence (AI) in post-pandemic Islamic Religious Education (PAI) learning. Unlike (Afrita 2023, 3185) research, which focused on improving efficiency and effectiveness in the general education system, this study contextualizes AI's role specifically in Islamic education at the higher education level. Furthermore, this research provides a new empirical contribution by measuring student satisfaction with AI-based religious learning integrated with Islamic values—a subject rarely examined quantitatively. Through the PIECES approach, this study not only evaluates the technological performance of AI but also explores its pedagogical and ethical dimensions relevant to Islamic education in the digital era. Thus, this study broadens the understanding of how AI can be effectively integrated into religious learning to create an adaptive, efficient, and spiritually grounded educational process.

METHOD

This study employed a mixed-methods approach, combining descriptive quantitative analysis to measure students' satisfaction levels using a Likert scale, and qualitative interpretation to explore the meaning and implications of implementing Artificial Intelligence (AI) in post-pandemic Islamic Religious Education (PAI) learning. The Likert scale used in this research ranged from 1 to 5, with response categories as described in Table 1.

Table 1. Likert Scale Instrument

Response Category	STS	TS	N	S	SS
Score Value	1	2	3	4	5

Based on Table 1, the questionnaire used in this study includes five response options: strongly disagree (STS), disagree (TS), neutral (N), agree (S), and strongly agree (SS). The questionnaire was completed by 61 respondents, all of whom were students of the Islamic Religious Education (PAI) program.

In this study, the PIECES framework was applied to analyze students' satisfaction with the use of Artificial Intelligence (AI) in PAI learning. The research subjects were students from the Islamic Religious Education Department at the State Islamic University (UIN) Sunan Ampel Surabaya. Data were collected through a structured questionnaire consisting of statements categorized into relevant PIECES domains. The collected responses were analyzed to determine the Average Satisfaction Score (*Rata-rata Tingkat Kepuasan* (RK)) using the following formula:

$$RK=\frac{JSK}{JK}$$

Where

RK : *Rata-rata tingkat kepuasan* (Average satisfaction score)

JSK : *Jumlah Skor Kuesioner* (Total questionnaire score)

JK : *Jumlah Kuesioner* (Total number of questionnaires)

To interpret the results, the average scores were matched against the Kaplan and Norton satisfaction assessment model, as presented in Table 2:

Tabel 2. Satisfaction Level Interpretation

No	Score Range	Interpretation
1	1,00 - 1,79	Very Dissatisfied
2	1,80 - 2,59	Dissatisfied
3	2,60 - 3,39	Neutral
4	3,40 - 4,19	Satisfied
5	4,20 – 5,00	Very Satisfied

RESULTS AND DISCUSSION

A total of 61 students from the Islamic Religious Education Program at UIN Sunan Ampel Surabaya participated in the study. The questionnaire, developed using the PIECES framework, was analyzed with the Likert scale to evaluate students' satisfaction across six domains: Performance, Information and Data, Economics, Control and Security, Efficiency, and Service. The results from each domain are presented in the following subsections.

The Performance domain assesses system functionality, ease of use, and clarity of AI display features. As presented in Table 3, most students selected *neutral* and *agree*, indicating consistent positive perceptions.

Table 3. Domain Performance

Statement	STS	TS	N	S	SS
The Artificial Intelligence display is easy to understand	0	0	44	13	4
AI is easy to use	0	0	40	18	3
The AI system functions properly	0	0	40	18	3
Total	0	0	124	49	10

Calculation for Performance Domain:

$$RK = \frac{(0x1) + (0x2)+(124x3)+(49x4)+(10x5)}{0+0+124+49+10}$$

$$RK= \frac{0+0+372+196+50}{183}$$

$$RK= \frac{618}{183}$$

$$RK= 3{,}3770491803$$

The Performance domain obtained an average score of 3.37, which falls within the Neutral category. This implies that while students generally find AI functional and usable, their satisfaction levels remain moderate. A large proportion of responses were in the *neutral* category, suggesting that students perceive AI tools as adequate but not exceptional in supporting PAI learning performance.

This domain evaluates the clarity, relevance, and usefulness of information generated by AI. List of statements and calculation results for the information and data domain.

Table 4. Information and Data Domain

Statement	STS	TS	N	S	SS
The display menu is easy to understand	0	0	39	18	4
Artificial Intelligence meets user needs	0	0	40	17	4
The information display from Artificial Intelligence is clear and easy to understand	0	0	35	23	3

Total	0	0	114	58	11

Calculation for Information and Data Domain:

$$RK = \frac{(0x1)+(0x2)+(114x3)+(58x4)+(11x5)}{0+0+114+58+11}$$

$$RK = \frac{0+0+342+232+55}{183}$$

$$RK = \frac{629}{183}$$

$$RK = 3{,}4371584699$$

The computed average score is RK=3,43. According to the interpretation scale, this falls into the "Satisfied" category. Students generally agree that AI provides clear and understandable information, with a menu display that is easy to navigate.

The Economics domain examines cost-related aspects, such as affordability and data consumption. List of statements and calculation results for the economics domain.

Table 5. Economics Domain

Statement	STS	TS	N	S	SS
Paid Artificial Intelligence offers more complete facilities and unlimited usage	0	0	40	17	4
Artificial Intelligence does not consume much internet data	0	0	40	18	3
Total	0	0	80	35	7

Calculation for Economics Domain:

$$RK = \frac{(0x1)+(0x2)+(80x3)+(35x4)+(7x5)}{0+0+80+35+7}$$

$$RK = \frac{0+0+240+140+35}{122}$$

$$RK = \frac{415}{122}$$

$$RK = 3{,}4016393443$$

The average satisfaction score obtained is RK= 3,40. This value also reflects a "Satisfied" interpretation. Students believe that AI-based tools do not consume excessive internet data and that paid versions offer additional features, although cost considerations remain moderate.

This domain measures students' perceptions of data security and AI's ability to support learning control. List of statements and calculation results for the control and security domain.

Table 6. Control and Security Domain

Statement	STS	TS	N	S	SS
Learning using Artificial Intelligence helps understand the material	0	0	36	21	4
User data is safe when accessing Artificial Intelligence	0	0	41	19	1
Total	0	0	77	40	5

Calculation for Control and Security Domain:

$$RK = \frac{(0x1)+(0x2)+(77x3)+(40x4)+(5x5)}{0+0+77+40+5}$$

$$RK = \frac{0+0+231+160+25}{122}$$

$$RK = \frac{416}{122}$$

$$RK = 3{,}4098360656$$

The calculated score is RK=3,40. This score falls under the "Satisfied" category. The findings suggest that students feel relatively secure when using AI platforms and acknowledge AI's role in assisting their understanding of learning materials.

Efficiency evaluates time, energy, and cost effectiveness as well as AI's contribution to academic knowledge. List of statements and calculation results for the efficiency domain.

Table 7. Efficiency Domain

Statement	STS	TS	N	S	SS
The use of Artificial Intelligence has proven efficient in terms of time, energy, and cost	0	0	41	19	4
The use of Artificial Intelligence adds academic knowledge	0	0	36	21	1
Total	0	0	77	40	5

Calculation for Efficiency Domain:

$$RK = \frac{(0x1)+(0x2)+(77x3)+(40x4)+(5x5)}{0+0+77+40+5}$$

$$RK = \frac{0+0+231+160+25}{122}$$

$$RK = \frac{416}{122}$$

$$RK = 3{,}4098360656$$

The average score is RK=3,40. This result is categorized as "Satisfied". Students perceive AI as efficient in supporting learning activities, reducing time constraints, and providing additional academic insights.

The Service domain assesses overall user experience and the extent to which AI-based services meet learners' needs. List of statements and calculation results for the service domain.

Tabel 8. Service Domain

Statement	STS	TS	N	S	SS
The services provided by Artificial Intelligence meet my needs	0	0	32	22	7
I have used Artificial Intelligence several times and I am satisfied	0	0	36	21	4
Total	0	0	68	43	11

Calculation for Service Domain:

$$RK = \frac{(0x1)+(0x2)+(68x3)+(43x4)+(11x5)}{0+0+68+43+11}$$

$$RK = \frac{0+0+204+172+55}{122}$$

$$RK = \frac{431}{122}$$

$$RK = 3{,}5327868852$$

The average satisfaction score for this domain is RK=3,52. Based on the interpretation scale, this falls in the "Satisfied" category. Students express positive experiences with AI services and indicate a willingness to use AI tools repeatedly due to satisfactory results.

The next step is to calculate all domain averages to determine the overall satisfaction score.

Table 9. Average Satisfaction Level of Artificial Intelligence Roles in PAI Learning

Domain	Average Score (RK)	Interpretation
Performace	3,38	Neutral
Information and Data	3,44	Satisfied
Economics	3,40	Satisfied
Control and Security	3,41	Satisfied
Efficiency	3,41	Satisfied
Service	3,53	Satisfied
Overall Average	**3,43**	**Satisfied**

Analysis of the average satisfaction scores across the six PIECES domains shows that students generally hold positive perceptions regarding the role of Artificial Intelligence (AI) in Islamic Religious Education (PAI) learning. The Performance domain obtained a score of 3.38, categorized as Neutral, indicating that students view AI tools as adequately functional but still requiring improvement in terms of usability and system responsiveness.

The Information and Data domain recorded a score of 3.44, falling into the Satisfied category, suggesting that students find AI-generated information clear, relevant, and useful in supporting learning activities. Similarly, the Economics (3.40), Control and Security (3.41), Efficiency (3.41), and Service (3.53) domains are all categorized as Satisfied, reflecting students' perceptions that AI tools are cost-effective, secure, efficient, and capable of delivering reliable services.

Overall, the average satisfaction score across all domains is 3.43, which is interpreted as Satisfied. This indicates that students generally support the integration of AI into PAI learning, acknowledging its benefits while still recognizing areas that could

be further developed—particularly in system performance and user experience.

The Urgency of Artificial Intelligence in Post-Pandemic Islamic Religious Education Learning

The findings of this study demonstrate that the integration of Artificial Intelligence (AI) into post-pandemic Islamic Religious Education (PAI) learning has generated a generally positive response among students. Using the PIECES framework, the majority of domains—Information and Data (3.44), Economics (3.40), Control and Security (3.41), Efficiency (3.41), and Service (3.53)—fall within the Satisfied category. Meanwhile, the Performance domain obtained a score of 3.38, categorized as Neutral. These results indicate that while AI is viewed as supportive and convenient for learning, certain aspects of system performance and usability still require improvement.

These findings are consistent with Yudoprakoso's (Yudoprakoso 2019, 453) argument that technological innovation provides added value in improving the quality of human life, particularly in the education sector. The results of this study reinforce that view by showing that AI integration in PAI learning contributes to accelerated learning processes, improved access to information, and increased student comfort and engagement in post-pandemic higher education settings.

The findings are also aligned with Ramadhan (Ramadhan 2018), who states that AI can mimic human cognitive abilities, especially in decision-making and problem-solving. In this study, such capabilities are reflected in how students use AI to explore Islamic references, clarify abstract concepts in aqidah and fiqh, and develop critical-thinking skills through interaction with AI-based systems. This suggests that AI supports not only the understanding of Islamic content but also the development of reflective and analytical reasoning essential for contemporary Islamic studies.

In addition to Ramadhan's perspective, the findings of this study also align with Saputra, Gitakarma, and Santo (Saputra,

Gitakarma, and Santo 2022, 15), who emphasize that AI provides broad benefits across various sectors, including education. Within the context of this research, AI facilitated student access to learning materials, supported independent understanding of religious concepts, and strengthened analytical and decision-making abilities. These results also support Lubis (Lubis 2021, 1), who argues that AI can perform reasoning and learning processes similar to humans, making its integration increasingly relevant in modern Islamic education environments.

AI has rapidly evolved to the point where it can imitate—and in some cases even replace—tasks traditionally performed by humans. Its development has been widely adopted by major technology companies such as Amazon, Meta, Microsoft, and Google. Beyond industry, AI has increasingly entered the educational sector, supporting learning processes and instructional design in various fields. Prominent figures like Bill Gates have highlighted AI's potential to transform education by improving access, efficiency, and personalized learning experiences (Ramadhan 2018, 1).

The findings of this study also show that technological advancements in the Industrial Revolution 4.0 era, including the Internet of Things (IoT), strengthen the urgency of adopting AI in PAI learning. This is consistent with Thohir et al. (Thohir et al. 2021, 2) who argue that digital transformation encourages more flexible and independent learning ecosystems. Students in this research reported increased autonomy, improved time efficiency, and better adaptation to digital learning methods when AI tools were integrated into their post-pandemic learning activities.

The results further reveal that students' levels of digital literacy and readiness significantly influence the effectiveness of AI-based learning. Learners with stronger digital competence were more capable of utilizing AI effectively to understand PAI materials. This supports the findings of Sijing and Lan (Sijing and Lan 2018, 1-5) and Chiu et al. (Chiu et al. 2022, 30-39), who

emphasize that digital literacy is a crucial factor in the successful implementation of AI technologies in educational environments.

The results also show that the effectiveness of AI in PAI learning is influenced by students' cognitive competencies. Respondents with higher critical and creative thinking skills reported greater satisfaction in using AI. This finding supports Chong and Shahrill (Chong and Shahrill 2016, 1-12) and M (M 2011, 343-347), who argue that individual competence plays an essential role in learning success. It also aligns with Biasi, Valencia, and Obregon (Biasi, Valencia, and Obregon 2020, 110); Kassymova (Kassymova 2020); Tsankov (Tsankov 2018, 67); and Geary (Geary 2002, 317-345), who assert that cognitive and reflective abilities are crucial foundations for 21st-century learning technologies.

These results further reinforce the findings of Mulianingsih et al. (Mulianingsih et al. 2020, 152)., which highlight that AI-based learning enhances focus and enables personalized learning. In the context of PAI, students stated that AI assisted them in understanding religious materials through approaches aligned with their interests and needs. For example, AI-based systems can adjust content delivery according to individual learning styles, thereby increasing engagement and concentration throughout both online and offline learning processes.

In addition, the findings support studies by Sanusi et al. (Sanusi et al. 2022, 8) and Yang, Huang, and Wu (Yang, Huang, and Wu 2011, 258-267), who emphasize the importance of collaboration and teamwork in technology-based learning. Students using AI not only learn individually but also engage in online discussions and group collaborations. The integration of AI in PAI learning has been shown to enhance communication, cooperation, and collective problem-solving skills. This aligns with Plotnikova and Strukov (Plotnikova and Strukov 2019, 110), who argue that teamwork enhances students' creativity and critical thinking abilities.

The findings of this study also support the conclusions of Beach et al. (Beach et al. 2015, 110), who argue that the utilization of digital literacy enhances learner engagement and self-confidence.

PAI students who are accustomed to using AI reported feeling more confident in exploring new areas of knowledge and participating actively in the learning process. This suggests that AI functions not merely as a technological tool, but also as a medium for cultivating scientific character and intellectual independence in the digital era.

Overall, the findings of this research provide empirical justification that the implementation of AI in post-pandemic PAI learning supports learning effectiveness and efficiency while strengthening values of independence, collaboration, and digital adaptability. These results demonstrate that AI holds strategic importance in shaping a modern and inclusive Islamic learning ecosystem oriented toward 21st-century competency development.

The Benefits of Artificial Intelligence in PAI Learning

Allah SWT has endowed humans with an extraordinary capacity for thought. Through this ability, humans can transform raw materials into valuable products by means of reflection and innovation. Today's technological progress is inseparable from human capability to turn what was once considered impossible into reality. In the past, long-distance communication seemed unthinkable, yet now it is easily achieved through various media such as telephones. The future of information technology will continue to expand and evolve in remarkable ways (Pratikno 2017, 26).

The findings of this study indicate that human capacity for thinking and innovation has facilitated significant technological advancements, including the development of AI for educational purposes. In Islamic Religious Education (PAI), AI plays an important role in enhancing learning effectiveness by providing access to relevant and accurate information. Students reported that AI assisted them in understanding course material and in organizing learning activities more independently and efficiently. These results support the view of Farid et al. (Farid et al. 2023, 779-788), who emphasize AI's ability to accelerate data processing,

support scheduling, and facilitate the management of learning tasks. The findings are also consistent with Oktaviyani (Oktaviyani 2023), who highlights that AI contributes to producing more accurate and efficient learning analyses, thereby supporting more precise decision-making within modern Islamic education systems.

In addition, this study reinforces Mulianingsih's view that AI-based learning can enhance focus and promote personalized learning. Students reported that AI systems help them understand PAI materials through more contextual approaches, such as adapting examples or analogies to individual interests and levels of understanding. This has a positive effect on increasing learning motivation and student engagement during both online and offline learning processes in the post-pandemic period (Mulianingsih et al. 2020, 148).

The findings of this study also show that the use of Artificial Intelligence (AI) in PAI learning continues to grow rapidly in line with the emergence of various modern AI models, one of which is ChatGPT, developed by OpenAI and launched on November 30, 2022. This finding supports the view of (Abd-Alrazaq et al. 2023, 1-4), who state that ChatGPT is an AI-based language model designed to interact with humans through natural conversation using machine learning and deep learning techniques. In the context of learning, some students use similar technologies to help them comprehend Islamic materials, construct academic arguments, and deepen their insights through text-based dialogues.

The study also revealed a cautious attitude among students toward the use of generative AI tools such as ChatGPT in academic writing. This reflects an awareness of potential risks associated with machine learning–based text generation. These findings are consistent with Munawar et al. (Munawar et al. 2023, 58), who emphasize the need for both internal and external validation of AI-generated outputs to maintain the authenticity, accuracy, and integrity of scientific work. The PAI students in this study demonstrated ethical responsibility by using AI primarily as a learning aid rather than as a substitute for independent reasoning.

This suggests that while generative AI offers significant potential for enhancing learning quality, its use must be accompanied by academic supervision and a strong commitment to upholding moral and scholarly values.

The findings of this study also align with Hwang et al. (Hwang et al. 2020, 4), who highlight AI's potential in fostering collaborative and innovative educational ecosystems. Based on the overall satisfaction score of 3.43 (Satisfied), AI implementation in PAI learning environments was perceived to improve efficiency, support personalized learning, and enhance interaction between lecturers and students. At the same time, these results underscore the importance of ensuring data privacy and security, as emphasized by Mambu et al. (Mambu et al. 2023, 2690). Protecting personal data remains a fundamental requirement to ensure that AI adoption in education proceeds ethically and sustainably.

Overall, the findings demonstrate that AI provides tangible benefits in PAI learning—improving academic quality, time efficiency, and student engagement. However, the success of its implementation ultimately depends on the integration of Islamic values within technological practices and on the ethical readiness of all parties involved in the educational process.

CONCLUSION

The findings of this study show that the integration of Artificial Intelligence (AI) into post-pandemic Islamic Religious Education (PAI) learning is generally well-received by students, with most PIECES domains—Information and Data (3.44), Economics (3.40), Control and Security (3.41), Efficiency (3.41), and Service (3.53)—categorized as Satisfied, while the Performance domain (3.38) is categorized as Neutral. The overall satisfaction score of 3.43 indicates a moderately positive acceptance of AI in PAI learning environments. These results demonstrate that AI contributes meaningfully to improving learning effectiveness, efficiency, access to resources, and student autonomy, while also

supporting more adaptive interactions between lecturers and students. Importantly, the findings confirm that AI can be integrated into PAI learning without diminishing Islamic values, as long as its use remains guided by ethical awareness and academic responsibility. Thus, AI holds strategic potential in shaping a modern, inclusive, and ethically grounded PAI learning ecosystem aligned with the development of 21st-century competencies.

The implications of these findings extend to pedagogical development, curriculum innovation, and institutional policy. The positive student perceptions toward AI indicate a readiness for more digitally enriched learning environments in Islamic higher education. This suggests the need for structured lecturer training in AI-assisted pedagogy, development of learning platforms that harmonize technological affordances with Islamic values, and refinement of instructional designs that leverage AI for personalized and student-centered learning. AI's ability to facilitate differentiated instruction also offers opportunities for enhancing curriculum responsiveness to diverse learning styles and needs.

Despite its contributions, this study has limitations that should be acknowledged. The research was conducted with a relatively small sample from a single institution, limiting the generalizability of the findings. The use of the PIECES framework primarily captures functional and satisfaction-related dimensions, leaving deeper affective, spiritual, or long-term cognitive outcomes unexplored. Additionally, the reliance on self-reported data may introduce subjective biases and does not measure actual learning performance. These limitations highlight the need for broader, multi-institutional, and multi-method investigations to more comprehensively assess the role of AI in Islamic education.

Future research should examine the long-term impact of AI on students' cognitive, ethical, and spiritual development within PAI learning contexts. Studies involving larger and more diverse populations are needed to validate the patterns identified in this research. Further inquiry should also explore lecturers' digital competence, institutional readiness, and the development of

Islamic ethical frameworks for responsible AI use. Comparative studies between PAI and other fields, as well as evaluations of generative AI tools such as ChatGPT in academic writing and critical reasoning, would provide deeper insight into both opportunities and potential risks associated with AI-assisted learning in Islamic higher education.

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