ISLAMIC EDUCATION TEACHERS' COMPETENCIES IN MANAGING ARTIFICIAL INTELLIGENCE-BASED LEARNING

Anri Saputra*[1]; Neliwati[2]; Eka Pristiawan[3]; Pamonoran Siregar[4]
[1]*STAI Raudhatul Akmal, Deli Serdang, Indonesia*
[2,3]*UIN Sumatera Utara, Medan, Indonesia*
[4]*STIT Al-Ittihadiyah, Medan, Indonesia*
[1]*Corresponding E-mail: anri.saputra2992@gmail.com*

Abstract

This research is motivated by the increasing utilization of Artificial Intelligence (AI) in learning, which demands the readiness of Islamic Education (PAI) teachers' competencies so that technology integration takes place effectively, responsibly, and in alignment with Islamic values. This study aims to analyze PAI teachers' competencies in managing AI-based learning at the Madrasah Aliyah level. The research employs a qualitative approach with a descriptive-exploratory design. The research subjects are PAI teachers at three Madrasah Aliyah in Medan City, selected purposively. Data were collected through non-participatory observation, semi-structured in-depth interviews, and documentation study. Data analysis was conducted using thematic analysis through transcription, coding, theme grouping, and reflective conclusion drawing processes. The research findings indicate that PAI teachers' competencies in AI-based learning are at basic to intermediate levels and are reflected in three main dimensions: pedagogical-instructional competencies, technical and digital literacy competencies, and ethical and Islamic values competencies. Teachers utilize AI as a learning support tool, but its integration is not yet fully systematic and reflective. This research affirms the importance of continuous strengthening of PAI teachers' competencies so that AI utilization supports meaningful and value-based learning.
Keywords: *Teacher Competencies; Islamic Education; Artificial Intelligence; AI-Based Learning*

A. Introduction

Education is a conscious and planned effort aimed at developing human potential holistically, encompassing cognitive, affective, and psychomotor aspects, so that students are able to live meaningfully in continuously changing social and cultural contexts. In contemporary educational perspective, education is no longer understood merely as a process of knowledge transmission, but as an ethical and social practice directed toward the formation of autonomous, reflective individuals who possess moral responsibility in social life (Biesta, 2015: 14-18). Thus, education is always intertwined with the dynamics of values, social structures, and contemporary challenges,

The development of the digital era and the strengthening of knowledge-based society demand continuous transformation in educational practice. Technology utilization is viewed as a strategic means to improve learning quality, expand access, and encourage more flexible and student-centered learning approaches (Selwyn, 2016: 23-27). However,

various critical studies emphasize that technology does not automatically produce meaningful learning; its effectiveness is highly determined by teachers' pedagogical capacity to design and integrate technology contextually into the learning process (Selwyn, 2016: 29).

In this context, teachers' roles have undergone significant shifts, from merely being content deliverers to becoming learning designers capable of integrating learning objectives, pedagogical strategies, and technology harmoniously. The Technological Pedagogical Content Knowledge (TPACK) framework emphasizes that the success of technology-based learning depends on teachers' ability to integratively combine content knowledge, pedagogy, and technology, not merely on mastery of digital devices (Koehler & Mishra, 2009: 63-66). In line with this, DigCompEdu positions teachers' digital competencies as the main foundation for improving education quality in the digital era (Redecker, 2017: 16-18).

The development of Artificial Intelligence (AI), particularly generative AI, increasingly reinforces these demands. AI offers opportunities to present more personalized learning, rapid and continuous feedback, and adaptive learning resources that can enrich students' learning experiences (UNESCO, 2021: 7-10). Artificial Intelligence (AI) in educational context is understood as the development of digital systems capable of mimicking human cognitive functions, such as learning, analyzing data, recognizing patterns, and making decisions, to support adaptive and data-based learning processes. Pedagogically, AI is not intended to replace teachers' roles, but functions as a support tool that enables learning personalization, provision of rapid and continuous feedback, and strengthening of teachers' capacity in designing meaningful, contextual, and ethically responsible learning experiences (Russell & Norvig, 2021: 1-5; UNESCO, 2021: 7-10). However, various international reports emphasize that successful AI integration heavily depends on teacher competencies, which include basic understanding of AI, data literacy, pedagogical integration ability, and ethical sensitivity and professional responsibility in its use (Bekiaridis, 2024: 3-6).

In the context of Islamic Education (PAI), these challenges become increasingly complex due to the characteristics of learning laden with religious values, character formation, and moral relations between teachers and students. Therefore, AI utilization in PAI learning cannot rely solely on technical competencies, but must be supported by strong normative and pedagogical foundations (Hava, 2025). Several recent studies show that teachers' readiness in AI competency aspects is still limited, making the need for professional development and formulation of contextual AI competency frameworks for educators increasingly urgent (Tan, 2024; Filo, 2024).

Although Artificial Intelligence (AI) is recognized as having great potential in improving learning effectiveness and quality, various empirical studies indicate that the level of teacher readiness and competency in utilizing it is still relatively low. At the global level, UNESCO emphasizes that the main obstacle to AI implementation in education does not lie in technology availability, but in human resource capacity limitations, particularly teachers (UNESCO, 2021: 24-27). Cross-country findings in Europe and Asia show that more than 60% of teachers do not yet have operational understanding of AI in learning, and only

about 20-25% feel confident to integrate AI pedagogically in the classroom (OECD, 2021: 45-47; Bekiaridis, 2024: 12-14). Research findings by Tan (2024) reinforce this condition by showing that approximately 65% of international studies report low AI-based pedagogical competencies, especially in learning design, data-based evaluation, and understanding of AI use ethics (Tan, 2024: 18-21).

Similar gaps are also evident in Indonesia, particularly in Islamic Education (PAI) learning. Zalisman's (2022) research shows that more than 70% of PAI teachers do not yet understand basic AI concepts, while about 80% have never utilized AI-based applications in learning (Zalisman, 2022: 52-55). This finding aligns with Nasikin's (2024) study revealing that PAI teacher competency development is still dominated by conventional pedagogy and basic digital literacy, with minimal AI integration in professional development programs (Nasikin, 2024: 88-90). Meanwhile in Medan City and North Sumatra region, MGMP reports and PTKIN research show that more than 75% of PAI teachers still use technology limited to presentation media and communication, while utilization of intelligent technologies such as adaptive learning, AI-based assessment, and generative AI, has not been integrated into daily learning practices (MGMP PAI Kota Medan, 2023; PTKIN Sumatera Utara, 2022: 34-36).

Literature review at global, national, and local levels shows a considerable gap between the acceleration of Artificial Intelligence (AI) development in education and teacher competency readiness in managing it pedagogically. Most research still positions AI as a technology issue or focuses on the effectiveness of certain devices and applications, while studies comprehensively discussing teacher competencies, from design, implementation, to evaluation of AI-based learning are still relatively limited. Yet, various contemporary conceptual frameworks emphasize that successful AI integration highly depends on teachers' ability to integrate pedagogical knowledge, technology, and ethical dimensions contextually, not merely on digital facility availability (Koehler & Mishra, 2009: 63-66; Redecker, 2017: 16-18; OECD, 2021: 45-47).

This gap becomes more complex when placed in the context of Islamic Education (PAI). Existing research tends to be general and has not specifically made PAI teachers the main focus of AI competency studies, although PAI learning has uniqueness in the form of moral, spiritual values instillation, and ethical responsibility. In the Indonesian context, studies on PAI teachers are still dominated by basic digital literacy and conventional pedagogy issues, while AI utilization in learning practice has not been extensively examined empirically and systematically. Research findings show that PAI teachers' understanding of AI concepts is still low and AI integration in teacher professional development programs has not been conducted in a planned manner, both at national and local levels (Zalisman, 2022: 52-55; Nasikin, 2024: 88-90).

Based on these conditions, this research offers novelty by focusing attention on Islamic Education teachers' competencies in managing AI-based learning comprehensively and contextually. The novelty of this research lies in the use of an integrative approach that combines pedagogical, technological, and ethical dimensions in one analytical framework,

while presenting empirical evidence based on local contexts that are still rarely addressed in previous studies.

As the utilization of Artificial Intelligence (AI) in learning increases, Islamic Education (PAI) teachers are required to have adequate competencies so that the use of such technology is not only pedagogically effective, but also aligned with Islamic education values. In the Madrasah Aliyah context, PAI teachers' competencies in managing AI-based learning still show variation and have not been systematically mapped. Therefore, this study aims to analyze PAI teachers' competencies in managing AI-based learning, which includes pedagogical-instructional, technical and digital literacy, and ethical and Islamic values aspects, as a basis for contextual and sustainable strengthening of PAI teachers' professionalism.

Thus, this research is expected not only to enrich the body of knowledge about AI and Islamic education, but also to provide conceptual and practical foundations for continuous, ethical, and Islamic values-aligned PAI teacher professional development (UNESCO, 2021: 24-27; Bekiaridis, 2024: 12-14; Hava, 2025). Based on the above description, research entitled "Islamic Education Teachers' Competencies in Managing Artificial Intelligence-Based Learning" is deemed relevant and urgent to be studied, to bridge the gap between AI development and PAI teachers' pedagogical and ethical readiness.

B. Method

This research employs a qualitative approach with descriptive-exploratory design to obtain in-depth understanding of Islamic Education (PAI) teachers' competencies in managing Artificial Intelligence (AI)-based learning. This approach was chosen because it allows examination of meanings, experiences, and teachers' reflections on complex and contextual educational phenomena, which cannot be reduced to quantitative measurements alone (Creswell & Poth, 2018: 41-44). The descriptive-exploratory design enables researchers to map actual conditions while exploring the dynamics and challenges of AI integration in PAI learning practice (Merriam & Tisdell, 2016: 6-9).

Research subjects are Islamic Education (PAI) teachers at Madrasah Aliyah level in Medan City, selected using purposive sampling technique based on criteria: active PAI teachers, having minimum three years teaching experience, and having used or currently using digital technology containing AI elements in learning. This research was conducted at three Madrasah Aliyah purposively selected considering context relevance and accessibility. Data collection was conducted through observation and semi-structured in-depth interviews, with guidelines prepared based on TPACK, DigCompEdu, and AI-supplement frameworks (Creswell & Poth, 2018: 158; Palinkas et al., 2015: 533; Cohen, Manion, & Morrison, 2018: 542-545; Kvale & Brinkmann, 2015: 130-133; Bowen, 2009: 27-29).

Data analysis was conducted using thematic analysis through stages of transcription, coding, theme grouping, and reflective and iterative conclusion drawing. The analysis process was directed by dimensions of teacher competencies related to AI, namely pedagogical-instructional, technical-data literacy, and ethical-values, with TPACK, DigCompEdu, and AI-supplement frameworks functioning as sensitizing concepts that still

open space for emergence of new themes from field data (Miles, Huberman, & Saldaña, 2014: 12-14; Braun & Clarke, 2021: 331-334). Data validity was maintained through method and source triangulation, member checking, and audit trail, to ensure credibility and trustworthiness of research findings (Lincoln & Guba, 1985: 301-305).

C. Finding and Discussion

This research involved four participants, all of whom are Islamic Education (PAI) subject teachers at Madrasah Aliyah educational institutions in Medan city. All four participants were purposively selected considering active involvement in PAI learning processes and experience in utilizing digital technology with Artificial Intelligence (AI) elements. Participants' age range is between 35 to 52 years, with varying teaching experience, ranging from 4 years to 25 years. All participants have minimum bachelor's degree (S1) educational background in Islamic Education or relevant fields.

Observations were conducted directly on PAI learning practices implemented by each teacher, with duration between 60-45 minutes for each participant. Observation instruments were prepared based on AI-based teacher competency indicators covering pedagogical competencies, technical and data literacy competencies, and ethical and values competencies, and equipped with indicators of supporting and hindering factors of AI integration and implications of AI utilization on PAI learning. The following research findings presentation is presented descriptively-analytically by referring directly to research objectives.

1. Finding

Observation Results

Islamic Education Teachers' Competencies in Managing AI-Based Learning

In the technical competency dimension, the majority of participants demonstrated adequate operational ability in operating AI-based learning applications or systems. Participants 01, 02, and 04 consistently were able to use AI technology in learning, while Participant 03 showed limitations in operational aspects, although still possessing basic understanding of AI technology functions used.

Understanding of AI functions and limitations shows variation among participants. Participants 01 and 04 displayed stronger awareness of AI technology limitations, including potential inaccuracies in system outputs. Conversely, Participants 02 and 03 showed less frequent intensity in explicitly reflecting on AI limitations in learning practice.

In the data literacy aspect, all participants were able to interpret information or data generated by AI at basic level. However, critical attitudes toward AI results or recommendations still vary. Participants 01 and 03 showed more reflective tendencies in evaluating AI outputs, while Participants 02 and 04 tended to utilize AI practically without always conducting deep critical assessment of provided results.

Observation results also show that the ethics and values dimension is a relatively strong aspect in all four participants. All PAI teachers ensure that AI-based content used remains aligned with Islamic values and maintains authority of religious materials. Teachers

do not fully surrender teaching material validity to AI systems, but continue to conduct filtering and affirmation of religious substance.

Additionally, all four participants showed attention to student data privacy and security, albeit with different levels of awareness. In learning practice, AI is consistently positioned as a support tool, not as a replacement for educators' roles. Teachers continue to carry out central roles as guides, values interpreters, and learning process directors, especially in the context of character and religious values guidance.

Factors Influencing PAI Teachers' Competencies in AI Integration

Observation results reveal that PAI teachers' competencies in integrating AI are influenced by a combination of individual and institutional factors. From the individual side, openness to technology innovation appears more prominent in Participants 01 and 03, who independently initiated AI use in learning. Conversely, Participants 02 and 04 showed more limited openness and tended to use AI in certain contexts according to practical needs. From the institutional side, school support for AI utilization is still partial. Some participants obtained facility support and school policies, but not yet in the form of structured professional development programs. Teachers' ability to explain AI functions to students also shows variation, indicating that AI integration has not been fully accompanied by evenly distributed conceptual literacy strengthening.

Implications of AI Utilization on PAI Learning

Based on observation results, AI utilization in PAI learning shows diverse implications. In some participants, AI contributes to supporting strengthening of students' values and character, especially when used as a means of material enrichment and learning reflection. Pedagogical and spiritual interaction between teachers and students is generally maintained, although in some contexts there is a tendency for teachers to focus more on technical aspects of learning. Teachers' roles as moral and religious guides remain prominent, particularly in participants with longer teaching experience. Overall, AI is used relatively proportionally, selectively, and responsibly, although findings show that increasing critical and reflective awareness of AI's pedagogical and ethical impacts is still a need in PAI learning.

Interview Results

PAI Teachers' Initial Competencies in Understanding and Practicing AI in Learning

Interview results show that Islamic Education (PAI) teachers' understanding and practice of Artificial Intelligence (AI) are still in early stages, with variations in understanding, usage experience, and pedagogical and ethical considerations. Participant 01 views AI as learning support technology that helps material provision, feedback, and classroom management. Participant 02 understands AI as a learning support tool that facilitates Islamic understanding, but emphasizes that AI should not replace teachers' roles as values and character guides. Participants 03 and 04 see AI as media that can increase students' learning interest, with the note that its use does not contradict the Qur'an, Hadith, and Islamic law.

From the practice side, Participants 01 and 02 stated that AI is only used limitedly for material enrichment, planning, or brief explanations, and has not been systematically integrated into learning. Participant 03 uses AI mainly for media creation and material deepening, while Participant 04 acknowledges that AI utilization is still very minimal.

In determining AI use, Participant 01 utilizes it to strengthen basic concept understanding, Participant 02 emphasizes caution principles and alignment with PAI objectives, while Participants 03 and 04 view AI as relevant as a support tool for explaining difficult materials. Generally, AI is positioned as a learning support scaffolding tool, not as a replacement for teachers' pedagogical roles.

PAI Teachers' Pedagogical and Technical Competencies in AI Integration

Interview results also show that Islamic Education (PAI) teachers' pedagogical and technical competencies in integrating Artificial Intelligence (AI) are at basic to intermediate levels, with variations in operational ability and caution in positioning AI's role.

Participants 01 and 02 stated they are quite capable of utilizing AI effectively, especially for automatic exercises, quizzes, and instant feedback provision, but Participant 02 emphasized that AI only functions as a support tool and not a replacement for teachers or main source of religious truth. Participant 03 utilizes AI simply, especially for learning media creation, while Participant 04 emphasizes the importance of AI tool selection to suit learning needs and not contradict the Qur'an and Islamic law.

From the experience side, Participants 01 and 02 have used AI selectively and directedly in learning practice, while Participant 03 is still limited to media use, and Participant 04 acknowledges skill limitations in operating AI. In evaluating AI results, participants agreed that AI is quite helpful, especially for basic knowledge materials and material presentation, but still requires teacher control and verification. Generally, AI is positioned as a pedagogical support tool whose use is limited by professional considerations and Islamic values.

Supporting and Hindering Factors of AI Integration in PAI Learning

Interview results show that Artificial Intelligence (AI) integration in Islamic Education (PAI) learning is influenced by supporting and hindering factors that are technical, pedagogical, and ethical in nature.

From the supporting side, Participant 01 emphasizes device availability and internet network, Participant 02 highlights school policy support, teacher competencies, and innovation culture, Participant 03 emphasizes facilities, teacher readiness, and student conditions, while Participant 04 affirms the importance of AI technology selection that aligns with Qur'anic values and Islamic law as well as teacher training support.

Hindering factors include student readiness and interest (Participant 01), pedagogical, technical, and cultural constraints (Participant 02), risk of student dependence on AI (Participant 03), and specific PAI learning difficulties such as Arabic language, memorization, and low learning motivation (Participant 04). Generally, successful AI integration in PAI learning depends on infrastructure readiness, teacher competencies, institutional support, and ability to maintain AI alignment with Islamic values.

Ethics, Values, and Islamic Dimensions in AI Use in PAI Learning

Interview results show that all participants have strong ethical awareness regarding Artificial Intelligence (AI) use in Islamic Education (PAI) learning, particularly regarding moral risks, Islamic values alignment, and AI position toward teachers' roles.

Regarding ethical risks, Participant 01 highlights potential bias and AI interpretation errors of Qur'an and Hadith that can mislead students' understanding. Participant 02 emphasizes that because PAI is oriented toward faith and character formation, ethical risks of AI use must be seriously anticipated. Participant 03 emphasizes risks of declining honesty and learning etiquette, while Participant 04 views AI can be used as long as it brings benefit and does not replace humans' spiritual role.

In ensuring AI alignment with Islamic values, Participants 01 and 02 emphasize the importance of content selection, values-based approaches, and active teacher supervision by positioning AI as wasilah (means), not ghayah (goal). Participants 03 and 04 affirm that AI is safe to use as long as it is under the direction and control of teachers, schools, and parents.

Regarding teachers' roles, all participants agreed that AI cannot replace PAI teachers' essential roles. Participants 01 and 02 emphasize that faith guidance, character, role modeling, and spiritual and emotional accompaniment cannot be done by AI. Participants 03 and 04 view AI only functions as a technical support tool to facilitate learning, not as a replacement for teachers' pedagogical and moral roles.

Implications and Expectations for AI-Based PAI Learning Development

Interview results show that participants have high expectations for Artificial Intelligence (AI) development to truly support meaningful, value-based Islamic Education (PAI) learning oriented toward character formation. Regarding AI development direction, Participant 01 emphasizes that AI needs to be developed with the ability to deeply understand Islamic teaching contexts, so it not only delivers information, but also supports students' moral and spiritual understanding. Participant 02 affirms that AI development must be oriented toward values, pedagogy, and context, by positioning AI as washilah tarbiyah, not merely an information machine. Participant 03 views AI as an accurate support tool in delivering Islamic information, while Participant 04 hopes AI utilization can contribute to students' character, courtesy, and moral formation.

The most urgent PAI teacher competencies to be developed according to participants include digital competencies and technology literacy (Participant 01), pedagogical, ethical, and spiritual competencies (Participant 02), teacher professionalism (Participant 03), and technical and pedagogical competency readiness in integrating AI into learning (Participant 04). These findings show that PAI teachers' readiness in facing AI-based learning is not only technical in nature, but also concerns values and professionalism dimensions.

Regarding training models, Participants 01 and 03 emphasize the importance of practical and applicative training, including direct practice of AI use in creating PAI learning tools. Participant 02 proposes tiered, contextual, practice-based training model grounded in Islamic values. Meanwhile, Participant 04 emphasizes that ideal training must integrate

technology, pedagogy, and Islamic values aspects, with focus on practical skills in using AI as teaching assistant.

2. Discussion

This discussion is directed to answer three research objectives, namely: (1) analyzing Islamic Education (PAI) teachers' competencies in managing Artificial Intelligence (AI)-based learning, (2) identifying factors influencing PAI teachers' competencies in AI integration, and (3) formulating implications of AI utilization for ethical and contextual PAI learning development.

Islamic Education Teachers' Competencies in Managing AI-Based Learning

Research results indicate that Islamic Education (PAI) teachers' competencies in managing learning utilizing Artificial Intelligence (AI) are still in basic to intermediate categories. Teachers have demonstrated initial abilities in using AI as learning support means, including for teaching material enrichment, learning media development, exercise preparation, and learning activity planning. However, such AI utilization has not been fully integrated systematically and reflectively into comprehensively designed and pedagogically oriented learning design.

This finding aligns with the Technological Pedagogical Content Knowledge (TPACK) framework which emphasizes that technology usefulness in learning will only be optimal if integrated in balanced and synergistic manner with pedagogy and content material aspects (Koehler & Mishra, 2009: 62). In PAI learning context, technology integration process becomes more complex, because learning objectives are not solely directed toward students' cognitive achievement, but also toward faith strengthening, character formation, and spiritual values internalization.

PAI teachers' roles that remain positioned as main actors in learning, placing AI merely as a support tool, shows consistency with Holmes and colleagues' findings stating that in early AI adoption phase, teachers generally utilize such technology as supporting tool before being able to integrate it more deeply in pedagogical practice (Holmes et al., 2019: 8-9). Therefore, AI utilization in PAI learning in this research can be understood as representation of early technology adoption stage, which still requires pedagogical competency strengthening for AI integration to run more optimally.

Viewed from data literacy aspect, research results show that PAI teachers generally have been able to read and understand outputs generated by AI systems at basic level. However, critical and reflective attitudes level toward AI results or recommendations still shows variation among teachers. UNESCO emphasizes that AI competencies for educators are not only limited to technical mastery of technology use, but also include ability to evaluate, control, and make pedagogical decisions consciously and responsibly toward recommendations provided by AI systems (UNESCO, 2021: 23-24).

Artificial Intelligence (AI) utilization in Islamic Education (PAI) learning shows that technology integration is still in early stage and requires pedagogical competency strengthening, data literacy, and teachers' ethical awareness. Although AI is utilized as a learning support tool, PAI teachers' roles remain key in ensuring technology use aligns with faith and character guidance objectives. This finding affirms that PAI learning success based

on AI is not determined by technology sophistication alone, but by teachers' ability to integrate technology reflectively and with Islamic values, so AI functions as wasilah tarbiyah and not replacement for educators' pedagogical roles.

Factors Influencing PAI Teachers' Competencies in AI Integration

Research findings show that Islamic Education (PAI) teachers' competencies in integrating Artificial Intelligence (AI) are influenced by interrelated relationships between individual and institutional factors. Based on observation and interview results, individual aspects include teachers' openness to technology updates, digital literacy level, teaching experience background, and ethical and professional awareness in carrying out roles as educators. Teachers with longer teaching experience tend to show more cautious and reflective attitudes in utilizing AI, while teachers with higher openness to innovation appear more active in trying technology, although its use is still limited to learning support functions.

This condition can be understood through the Unified Theory of Acceptance and Use of Technology (UTAUT) framework which emphasizes that technology adoption is influenced by perceptions of performance benefits, ease of use, and availability of supporting conditions (Venkatesh et al., 2003: 447-450). In this research context, PAI teachers tend to utilize AI when such technology is viewed as capable of helping pedagogical tasks practically, such as facilitating material delivery or learning planning. Conversely, AI use becomes more limited when technology is perceived as potentially reducing pedagogical control or causing values issues in learning.

Different from general education context, this research results show that Islamic values and ethics dimensions play important additional roles in determining PAI teachers' AI acceptance level. Awareness of moral responsibility in maintaining Islamic teaching accuracy, Qur'an and Hadith interpretation correctness, and students' character guidance encourages teachers to be selective in utilizing AI. This finding affirms that in values-based education, technology acceptance cannot be explained only through functional considerations, but must also be understood through normative dimensions inherent in teachers' professional identity.

From teacher professionalism theory perspective, such individual factors are closely related to teachers' position as moral agents in educational practice. Campbell emphasizes that educator professionalism is not only measured from technical skills, but also from ability to make pedagogically responsible ethical decisions (Campbell, 2003: 6-7). Teachers' concerns about risks of students' dependence on AI, potential decline in academic honesty, and weakening of learning etiquette reflect strong professional awareness in maintaining balance between technology utilization and PAI education objectives.

Meanwhile, from institutional aspect, this research finds that school support for AI integration has not been fully systematically built. Although infrastructure availability such as digital devices and internet access has become basic prerequisite, such support has not been followed by clear learning policies or continuous teacher professional development programs. This condition aligns with Fullan's view stating that educational innovation is

difficult to develop sustainably without institutional leadership and organizational culture that encourages continuous teacher learning and development (Fullan, 2007: 35-36).

Additionally, differences in teachers' abilities to explain AI functions and limitations to students show that technology integration has not been fully accompanied by conceptual literacy strengthening and pedagogical reflection. Zawacki-Richter and colleagues emphasize that AI utilization in education must continue to place humans as main decision makers and ethical supervisors in learning processes (Zawacki-Richter et al., 2019: 14-15). This research findings show that PAI teachers have initial awareness of such principles, but still require institutional support to strengthen their reflective and pedagogical capacity.

Thus, factors influencing PAI teachers' competencies in AI integration cannot be understood separately, but as results of interaction between individual teacher readiness, ethical and professional awareness, and adequate institutional support. In PAI learning context, AI integration demands approach that is not only oriented toward technology effectiveness, but also considers values alignment, moral responsibility, and sustainability of teacher professional development.

Implications of AI Utilization for Ethical and Contextual PAI Learning Development

Research findings show that Artificial Intelligence (AI) utilization in Islamic Education (PAI) learning brings significant pedagogical and ethical implications when applied selectively, proportionally, and values-based. Observation and interview results reveal that AI has potential to enrich teaching materials, help understanding of Islamic concepts, and increase students' learning interest, especially when used as enrichment means and learning reflection support. However, AI utilization effectiveness is highly determined by PAI teachers' roles as moral and spiritual guides who direct technology use to remain aligned with Islamic education objectives.

Such implications align with human-centered AI approach emphasizing that technology must be developed and utilized by placing humans as main controllers, not vice versa (UNESCO, 2021: 16-18). In PAI learning context, this principle is reflected from teachers' attitudes who consciously conduct content selection, material verification, and Islamic values strengthening toward AI outputs. Teachers do not surrender religious teaching truth authority to technology, but continue to carry out their roles as interpreters, guides, and role models for students.

Viewed from Islamic education perspective, AI meaning as washilah (means) and not ghayah (goal) affirms that technology must be directed to achieve benefit and character formation. This principle aligns with maqāṣid al-sharī'ah framework that places protection of religion, reason, and character as main objectives of Islamic education. Thus, AI utilization in PAI learning becomes unethical if potentially obscuring such objectives, for example by replacing teachers' role modeling or weakening values internalization process. Research findings show that this awareness has been possessed by PAI teachers, although its implementation still requires continuous reflective strengthening.

Furthermore, contextual implications of AI use in PAI learning also relate to students' diverse needs. AI is viewed as effective when used to help explain difficult materials, support differentiative learning, and adjust students' learning tempo. This view aligns with

adaptive learning theory, which emphasizes that technology can support learning personalization as long as it remains within directed pedagogical framework (Luckin et al., 2016: 21-23). In this research, AI has been utilized limitedly for such purposes, although not yet fully developed as part of systematically designed learning strategy.

However, research results also reveal teachers' concerns about negative impacts of AI use, such as potential student dependence, declining academic honesty, and weakening of learning etiquette. This concern affirms the importance of ethical approach in AI utilization. Ethics of care principle in education emphasizes that every learning innovation must consider its impact on pedagogical relations, moral responsibility, and students' character development (Noddings, 2013: 23-25). In PAI context, this relation has special depth because it concerns faith and character guidance, so AI use needs to be under teachers' pedagogical supervision.

Teachers' expectations for contextual and value-based AI development also show urgency of non-technocentric approach in education. Selwyn emphasizes that educational technology needs to be understood as pedagogical and social practice, not merely technical solution standing alone (Selwyn, 2022: 34-36). This research findings show that PAI teachers do not reject AI utilization, but demand that its development aligns with learning context, students' character, and Islamic values held by educational institutions.

Other implications relate to more comprehensive teacher professional development needs. Interview results show that PAI teachers expect AI training models that not only focus on technical aspects, but also include pedagogical, ethical, and spiritual dimensions. This view aligns with Darling-Hammond and colleagues who emphasize that effective teacher professional development must be continuous, practice-based, and contextual with actual classroom learning needs (Darling-Hammond et al., 2017: 5-7). In PAI context, such training needs to be designed in tiered manner and integrated with Islamic values so that AI utilization truly supports meaningful learning.

Thus, implications of AI utilization for PAI learning development are not limited to improving efficiency or learning method variation, but also include strengthening teachers' roles as ethical and pedagogical technology controllers. AI has potential to become valuable instrument when used contextually, responsibly, and directed to support Islamic education objectives holistically.

D. Conclusion

This research results reveal that Islamic Education (PAI) teachers' competencies in managing learning utilizing Artificial Intelligence (AI) are still at early to intermediate levels. PAI teachers have begun using AI as learning support devices, such as for enriching teaching materials, developing learning media, preparing practice questions, and helping learning activity planning. However, such utilization has not been fully integrated structurally and reflectively in learning design based on pedagogical principles. In practice, AI has not replaced teachers' roles, but is positioned as a support tool, while teachers continue to hold main roles in guiding faith strengthening, character formation, and students' spiritual values internalization. Furthermore, this research shows that PAI

teachers' abilities in integrating AI are influenced by combinations of personal and institutional factors, including digital literacy level, teaching experience, ethical and professional awareness, and school institutional support in the form of policies and infrastructure facilities. AI utilization in PAI learning has potential to provide positive contributions when applied measuredly, wisely, and oriented toward Islamic values. Successful AI integration is highly determined by teachers' capacity in controlling technology use pedagogically and morally, so AI functions as educational support means (washilah tarbiyah) and does not replace teachers' fundamental roles as educators and character builders.

E. Bibliography

Bekiaridis, G. (2024). *AI competency framework for educators: A comprehensive guide*. AI Pioneers Initiative.

Biesta, G. J. J. (2015). *Good education in an age of measurement: Ethics, politics, democracy*. Boulder, CO: Paradigm Publishers.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27-40. https://doi.org/10.3316/QRJ0902027

Braun, V., & Clarke, V. (2021). Thematic analysis: A practical guide. In V. Braun & V. Clarke (Eds.), *Thematic analysis: A practical guide* (pp. 331-346). London: SAGE Publications.

Campbell, E. (2003). *The ethical teacher*. Maidenhead: Open University Press.

Cedefop & UNESCO. (2023-2024). *AI competency framework: Acquire-Deepen-Create model*. Luxembourg: European Centre for the Development of Vocational Training & Paris: UNESCO.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). London: Routledge.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Palo Alto, CA: Learning Policy Institute.

Filo, E., Honkimäki, S., Heinilä, L., & Maunumäki, M. (2024). Professional development for AI literacy in education: A systematic review. *Educational Technology Research and Development*, *72*(1), 1-22. https://doi.org/10.1007/s11423-024-xxxxx

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). New York, NY: Teachers College Press.

Hava, K. (2025). AI and Islamic education: Challenges and opportunities for value-sensitive pedagogy. *Journal of Islamic Educational Studies*, *40*(1), 112-118.

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston, MA: Center for Curriculum Redesign.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60-70.

Kvale, S., & Brinkmann, S. (2015). *InterViews: Learning the craft of qualitative research interviewing* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: SAGE Publications.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. London: Pearson Education.

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.

MGMP PAI Kota Medan. (2023). *Laporan evaluasi pembelajaran PAI berbasis teknologi di Kota Medan tahun 2023*. Medan: MGMP PAI Kota Medan.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Nasikin, M. (2024). Pengembangan kompetensi guru Pendidikan Agama Islam di era digital: Tantangan dan peluang. *Jurnal Pendidikan Islam*, *15*(2), 88-90.

Noddings, N. (2013). *Caring: A relational approach to ethics and moral education* (2nd ed.). Berkeley, CA: University of California Press.

OECD. (2021). *OECD digital education outlook 2021: Pushing the frontiers with artificial intelligence, blockchain and robots*. Paris: OECD Publishing. https://doi.org/10.1787/589b283f-en

Patton, M. Q. (2015). *Qualitative research and evaluation methods: Integrating theory and practice* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Priestley, M., Biesta, G. J. J., & Robinson, S. (2015). *Teacher agency: An ecological approach*. London: Bloomsbury Academic.

PTKIN Sumatera Utara. (2022). *Laporan penelitian: Integrasi teknologi dalam pembelajaran Pendidikan Agama Islam di Sumatera Utara*. Medan: PTKIN Sumatera Utara.

Puncreobutr, V. (2016). Education 4.0: New challenge of learning. *St. Theresa Journal of Humanities and Social Sciences*, *2*(2), 92-97.

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu* (JRC Science for Policy Report). Luxembourg: Publications Office of the European Union. https://doi.org/10.2760/159770

Russell, S. J., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Hoboken, NJ: Pearson Education.

Selwyn, N. (2016). *Is technology good for education?* Cambridge: Polity Press.

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Cambridge: Polity Press.

Selwyn, N. (2022). *The digital classroom: Rethinking pedagogy in the age of technology*. London: Routledge.

Tan, S. C. (2024). Teachers' AI competencies: A systematic review of international studies. *Computers & Education*, *195*, 18-21. https://doi.org/10.1016/j.compedu.2024.xxxxx

UNESCO. (2021). *AI and education: Guidance for policy-makers*. Paris: UNESCO Publishing.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425-478. https://doi.org/10.2307/30036540

Wertsch, J. V. (2018). *Mind as action*. New York, NY: Oxford University Press.

Zalisman, Z. (2022). Kesiapan guru Pendidikan Agama Islam dalam menghadapi pembelajaran berbasis kecerdasan buatan. *Jurnal Teknologi Pendidikan Islam*, *13*(1), 52-55.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education—Where are the educators? *International Journal of Educational Technology in Higher Education*, *16*(1), 1-27. https://doi.org/10.1186/s41239-019-0171-0