Journal of General Education and Humanities
Vol. 5, No. 4, August 2026, pp. 5675 – 5687, https://doi.org/10.58421/gehu.v5i4.1860
ISSN 2963-7147

Readiness Profile of Islamic Religious Education Teachers in Integrating Artificial Intelligence: A Four-Dimensional Descriptive Study

Muhammad Ruslan[1], Abd Rahman[2]
[1,2]Universitas Muhammadiyah Sumatera Utara, Medan, Indonesia

Article Info

Article history:

Received 2026-07-09
Revised 2026-07-31
Accepted 2026-08-04

Keywords:

Artificial Intelligence (AI)
Islamic Religious Education
Pedagogical Competence
Teacher Readiness
TPACK

ABSTRACT

The rapid development of artificial intelligence (AI) requires teachers to integrate it meaningfully into their instructional practice, including in Islamic Religious Education (Pendidikan Agama Islam, PAI), a subject whose knowledge content is inseparable from religious values. Research on AI readiness among PAI teachers in Indonesia remains dominated by literature reviews and small-scale qualitative studies, leaving a gap in quantitative mapping that systematically decomposes readiness into empirically measurable dimensions. This study aims to describe the self-reported readiness profile of PAI teachers who are currently enrolled as students in the Master of Islamic Religious Education (MPAI) program at the Faculty of Islamic Studies, Universitas Muhammadiyah Sumatera Utara (UMSU), for integrating AI into PAI instruction, across four dimensions: (1) basic AI literacy and skills, (2) pedagogical competence in AI–PAI integration, (3) attitudes and perceptions toward AI, and (4) institutional and facility support. This quantitative descriptive study used a 15-item, five-point Likert questionnaire distributed openly to the entire eligible population of MPAI students at the UMSU Faculty of Islamic Studies (eligible population ≈300) via WhatsApp groups, direct distribution, and assistance from the MPAI study program. Seventy-four responses were received (response rate ≈24.7%). All four dimensions fell into the High category. Attitudes/perceptions toward AI recorded the highest mean score (M = 4.19; SD = 0.96), followed by basic AI literacy (M = 4.01; SD = 1.05), institutional support (M = 3.87; SD = 1.00), and pedagogical competence in AI–PAI integration recorded the lowest score (M = 3.86; SD = 1.07). Instrument reliability was excellent across all dimensions (Cronbach's alpha 0.871–0.973). A descriptive gap was found between teachers' highly positive affective attitudes toward AI and their applied pedagogical competence in designing AI-based PAI instruction, without accompanying inferential statistical testing of the significance of this difference. This study offers a baseline readiness map that contextually applies a technology-readiness framework to the domain of PAI, and may serve as an initial reference for MPAI curriculum development and for AI training policies more specifically targeted at strengthening pedagogical competence, rather than attitude alone.

Corresponding Author:

Muhammad Ruslan
Department of Islamic Religious Education, Faculty of Islamic Studies, Universitas Muhammadiyah Sumatera Utara, Medan, Indonesia
Email: muhammadruslan@umsu.ac.id

1. INTRODUCTION

Artificial intelligence (AI) is reshaping education systems worldwide, and generative AI tools in particular have opened new avenues for teachers to design more personalized, efficient, and interactive learning experiences — a trend well documented in recent systematic reviews of AI integration in teacher professional development [1]. In its broadest sense, AI is understood as a branch of computer science concerned with building systems capable of performing tasks that normally require human intelligence, such as reasoning, pattern recognition, and adaptive decision-making [2]. In Islamic education, however, AI presents both distinct opportunities and challenges: Islamic Religious Education (PAI) is not merely a vehicle for knowledge transmission but also a space for character formation and spiritual development, which demands ethical caution in AI implementation [3], [4].

A number of recent studies indicate that AI integration in Islamic education in Indonesia still faces fundamental obstacles, ranging from limited teacher digital literacy to inadequate institutional training, as well as concerns about the scholarly validity and religious appropriateness of AI-generated content [5], [6]. Within the specific context of Muhammadiyah-based education, AI has been found to influence the learning process by supporting access to information and interactive learning media. However, its use still requires institutional oversight to ensure that its impact on Islamic and Muhammadiyah educational values remains positive [7]. International studies generally show a consistent pattern: teachers tend to hold very positive attitudes toward AI, but actual classroom implementation lags far behind those attitudes. A large-scale study of general and special education teachers in the United Arab Emirates, for instance, found attitude scores toward AI to be far higher than actual classroom practice scores, with knowledge scores falling in between [8]. Similar patterns have been reported among teachers in Nigeria [9] and Kenya [10], where affective readiness toward AI consistently outpaces technical competence.

This attitude–competence gap warrants particular attention among PAI teachers in Indonesia, because integrating AI into PAI instruction requires not only technological skills but also pedagogical competence to design learning experiences that preserve the authenticity of Islamic values [11], [12]. To date, research on AI readiness among Indonesian PAI teachers remains dominated by literature reviews and small-scale qualitative studies [13]–[15], leaving a gap for quantitative research that systematically decomposes readiness into empirically measurable dimensions.

Theoretically, this study is grounded in the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler [17], which posits that effective technology integration in teaching depends on the dynamic interaction of three knowledge domains: content knowledge, pedagogical knowledge, and technological knowledge. These domains do not stand alone; their dynamic interaction shapes teachers' contextual judgment in selecting and applying technology appropriately for a given subject and pedagogical purpose. This framework continues to evolve in the generative AI era: Mishra et al. [16] argue that the emergence of ChatGPT and large language models calls for an expansion of TPACK that treats AI literacy as an explicit component of technological knowledge, while Chiu et al. [18] developed and validated the Teacher AI Competence Self-

Efficacy (TAICS) scale, showing that technical self-efficacy is a distinct and important predictor of successful AI integration that cannot be reduced to positive attitude alone. This is reinforced by technology-acceptance frameworks — including the Technology Acceptance Model (TAM) and its extensions incorporating Diffusion of Innovation, Reasoned Action Theory, and the Technology-Organization-Environment framework [19] — which hold that technology acceptance is shaped by perceived usefulness and perceived ease of use, but which a systematic review by Ali et al. [20] found to be more reliable in explaining usage intention than actual implementation competence. Substantial empirical evidence supports this distinction: Fteiha et al. [8], studying teachers in the UAE, found that positive attitudes toward AI consistently exceeded both knowledge and actual classroom practice, while Kohnke et al. [21], studying university language instructors, found that positive attitudes toward generative AI were not matched by adequate institutional support or professional development for genuine classroom implementation. Together, these findings suggest that strengthening attitude alone is insufficient for meaningful technology integration; explicit development of technical and pedagogical competence is also required.

Unlike general subjects, integrating AI into PAI carries its own distinct ethical and theological considerations. Djazilan et al. [3] argue that AI use in Islamic education must balance technological innovation with the preservation of core Islamic values, while Supriatin et al. [4] propose an AI ethics framework for Islamic education grounded in maqāṣid al-sharīʿah and thematic Qur'anic exegesis. Achruh et al. [5] identify infrastructure limitations, uneven teacher digital competence, and inconsistent institutional training policies as major barriers to AI adoption in Islamic education in Indonesia. Through a SWOT analysis, Abubakari et al. [22] show that the opportunities of AI-personalized religious learning are matched by risks related to the accuracy and scholarly validity of AI-generated religious content. Within the specific context of Muhammadiyah-based education, Sari et al. [7] report a similar pattern: AI use can support access to learning materials and enrich instructional variety, but its adoption still requires institutional guidance to ensure its influence on Islamic and Muhammadiyah educational values remains positive rather than disruptive. Several recent studies confirm this distinctive attitude–competence gap specifically within Islamic education. Faizin et al. [23], applying an extended TAM to 224 Muslim university students across 12 Indonesian universities, found that perceived ease of use and usefulness shaped highly positive attitudes toward AI, yet actual use in religious learning remained limited. Reksiana et al. [6] emphasize the need for sustained digital literacy development among PAI teachers as a prerequisite for integration competence, while Supriyadi et al. [24] developed the DEEP-AI pedagogical model to strengthen AI-assisted Qur'anic exegesis literacy while maintaining valid exegetical principles. Qualitative studies [11], [13]–[15], [25], [26], [12] consistently report that PAI teachers show high openness toward AI yet still face technical and pedagogical barriers in actual classroom implementation. This distinctive characteristic is the basis for measuring pedagogical competence in AI–PAI integration separately from general attitude and technical literacy in this study.

The novelty of this study lies not in developing an entirely new readiness construct, but in the contextual application of this multidimensional technology-readiness framework

to the PAI domain specifically — a context that carries its own ethical and theological considerations not fully captured by AI-readiness instruments designed for general education. Addressing this gap, this study describes the self-reported readiness profile of PAI teachers — currently enrolled as students in the Master of Islamic Religious Education (MPAI) Program at the Faculty of Islamic Studies, Universitas Muhammadiyah Sumatera Utara (UMSU) — for integrating AI into PAI instruction, across four dimensions: (1) basic AI literacy and skills, (2) pedagogical competence in AI–PAI integration, (3) attitudes and perceptions toward AI, and (4) institutional and facility support.

The contribution of this study is twofold. Theoretically, it enriches the application of the TPACK framework as extended to the generative AI era [16] within the context of religious education, which carries a distinctively ethical-theological dimension. Practically, the findings are intended to serve as an empirical baseline for MPAI curriculum development and for formulating AI training policies that more precisely target their intended audiences — study programs, teacher training providers, and Islamic education policymakers alike.

2. METHOD

2.1 Research Design

This study employed a quantitative descriptive survey design to map the self-reported readiness of PAI teachers for integrating AI into instruction, without hypothesis testing or manipulation of research variables. A purely descriptive design was chosen because the study's purpose is to build a baseline profile rather than test relationships between variables; accordingly, no inferential statistical testing was conducted.

2.2 Research Location and Timeline

This study was conducted among students of the Master of Islamic Religious Education (MPAI) Program, Faculty of Islamic Studies, Universitas Muhammadiyah Sumatera Utara (UMSU). Data collection took place online from June 21–29, 2025.

2.3 Population and Sample

The research population comprised all MPAI students at the UMSU Faculty of Islamic Studies who were actively teaching PAI, either in formal institutions (elementary/Islamic elementary schools, junior/Islamic junior high schools, senior/Islamic senior/vocational high schools) or non-formal institutions (Qur'an memorization houses, ma'had, pesantren). Based on confirmation from the Head of the MPAI Study Program, the eligible population during the data collection period was approximately 300 students.

The questionnaire was distributed openly to the entire population through a WhatsApp group encompassing all MPAI students, supplemented by direct distribution to a number of students via private messages, and with distribution assistance from the MPAI Study Program administration. Because the questionnaire link was openly available to the entire population while participation was voluntary and responses occurred through self-selection, this technique is most accurately described as non-probability sampling via an open invitation to the entire population (open self-selection sampling).

A total of 74 respondents responded out of the entire eligible MPAI population. Based on an eligible population of approximately 300 students, the response rate for this study was approximately 24.7%. Respondents were distributed across various institution types: elementary/Islamic elementary schools (n=29; 39.2%), senior/Islamic senior/vocational high schools (n=21; 28.4%), junior/Islamic junior high schools (n=17; 23.0%), and non-formal institutions such as Qur'an memorization houses/ma'had/pesantren (n=7; 9.5%). This study did not collect additional demographic data such as age, gender, years of teaching experience, prior AI training history, frequency of AI use, or internet/digital device access separately, as the original instrument was not designed to capture these variables. This limitation is explicitly acknowledged in the Research Limitations section.

Because participants were drawn from a single graduate cohort (MPAI) at a single institution, they may be more academically motivated and more digitally literate than the general population of PAI teachers in Indonesia. This selection bias should be considered when interpreting the findings, and the results cannot be generalized beyond this specific cohort.

2.4 Sampling Technique

This study used a non-probability sampling technique via open invitation to the entire eligible population, with voluntary participation.

2.5 Data Source

This study used primary data collected directly from PAI teachers through a self-administered online questionnaire.

2.6 Data Collection Technique

Data were collected through a self-administered online survey using the Google Forms platform. The questionnaire link was distributed through a WhatsApp group encompassing all MPAI students, direct distribution to a number of students individually, and with distribution assistance from the MPAI Study Program. Because part of the distribution was assisted by the Study Program in which respondents were enrolled, there is potential for social desirability bias — respondents may have felt inclined to provide more positive answers knowing the survey's institutional connection. This potential bias is acknowledged as a methodological limitation (see Research Limitations section). However, the risk of a direct power relationship between a specific course instructor and their individual students is relatively low, as distribution occurred through general study-program channels rather than through a specific instructor to students they were currently grading.

2.7 Research Instrument

Data were collected using a closed, five-point Likert-scale questionnaire (1 = Strongly Disagree, 5 = Strongly Agree) consisting of 15 items, grouped into four conceptual dimensions based on the theoretical framework outlined above: (1) Basic AI Literacy and Skills (4 items), (2) Pedagogical Competence in AI–PAI Integration (3 items), (3)

Attitudes/Perceptions toward AI (5 items), and (4) Institutional and Facility Support (3 items).

It should be noted that the section structure of the original questionnaire (Sections A–D) does not fully align with the analytical dimension grouping used in this study: the item "I believe AI can improve the effectiveness of PAI learning" was administratively located in Section B (Pedagogical Readiness) in the original questionnaire, but was conceptually reclassified into the Attitudes/Perceptions toward AI dimension in this analysis, because the item measures affective belief in AI's benefits rather than technical competence in designing instruction. With this reclassification, the Pedagogical Competence in AI–PAI Integration dimension contains 3 items and the Attitudes/Perceptions dimension contains 5 items.

All competence and readiness indicators are self-assessed by respondents, rather than measured through performance-based tasks. The instrument therefore captures self-reported readiness and self-assessed competence, not objectively demonstrated applied ability.

2.8 Variables and Measurement

As a descriptive study, this research did not test relationships between independent and dependent variables. Instead, four descriptive constructs were measured:

1. Basic AI Literacy and Skills — teachers' self-reported understanding of AI concepts and ability to operate common AI tools, measured through 4 Likert items.
2. Pedagogical Competence in AI–PAI Integration — self-assessed ability to design and select AI-based PAI instruction, measured through 3 Likert items.
3. Attitudes/Perceptions toward AI — self-reported openness, interest, and beliefs regarding the value of AI in education, measured through 5 Likert items.
4. Institutional and Facility Support — self-reported perceptions regarding the availability of training, facility access, and school support, measured through 3 Likert items.

Each construct was operationalized as the mean of its constituent items on a 1–5 scale.

2.9 Validity and Reliability

Internal reliability for each dimension was tested using Cronbach's alpha, with an acceptable threshold of ≥0.70. All four dimensions showed values well above this threshold (0.871–0.973; see Table 1). Coefficients above 0.95 — found in the Basic AI Literacy, Pedagogical Competence, and Attitudes/Perceptions dimensions — are interpreted with caution, as extremely high alpha values may indicate item redundancy rather than purely reflecting instrument quality [27].

Construct validity testing (e.g., through expert judgment or exploratory factor analysis) was not conducted prior to data collection. This limitation is explicitly acknowledged in the Conclusion section.

2.10 Data Analysis Technique

Data were analyzed using descriptive statistics (means and standard deviations) at both the item and dimension levels, calculated using Python (pandas, numpy) on the cleaned dataset (N=74). Readiness levels were categorized using class intervals based on a theoretical score range of 1–5: 1.00–1.80 (Very Low), 1.81–2.60 (Low), 2.61–3.40

(Moderate), 3.41–4.20 (High), and 4.21–5.00 (Very High). No inferential statistical tests (e.g., t-tests) were conducted to compare means across dimensions; observed differences between dimensions are therefore reported descriptively, not as statistically proven gaps.

2.11 Ethical Considerations

Participants were informed of the study's purpose prior to completing the questionnaire. Participation was voluntary, and respondents could withdraw at any time without consequence. All responses were kept confidential and used solely for the purposes of this study; no individually identifiable respondent data is reported in the results.

3. RESULTS AND DISCUSSION

3.1 Respondent Characteristics and Instrument Reliability

The research sample consisted of 74 PAI teachers who were active MPAI Program students. Respondents were distributed across various institution types: elementary/Islamic elementary schools (39.2%), senior/Islamic senior/vocational high schools (28.4%), junior/Islamic junior high schools (23.0%), and non-formal institutions such as Qur'an memorization houses/ma'had/pesantren (9.5%). Additional demographic data such as age, gender, and years of teaching experience were not available in this study's instrument (see Research Limitations section).

Reliability testing showed excellent Cronbach's alpha coefficients across all four dimensions, as summarized in Table 1.

Table 1. Instrument Reliability Test Results (N=74)

Dimension	Number of Items	Cronbach's Alpha	Category
Basic AI Literacy and Skills	4	0.944	Excellent
Pedagogical Competence in AI–PAI Integration	3	0.960	Excellent
Attitudes/Perceptions toward AI	5	0.958	Excellent
Institutional and Facility Support	3	0.871	Good
Overall Instrument	15	0.973	Excellent

All alpha values were well above the minimum threshold of 0.70, indicating strong internal consistency for each dimension as well as the instrument as a whole. The very high values for the Pedagogical Competence (0.960) and Attitudes/Perceptions (0.958) dimensions, however, are interpreted with caution, as they suggest possible conceptual overlap among items within these two dimensions rather than purely reflecting instrument quality [27]. Future research could consider sharper content differentiation among items to reduce this potential redundancy while improving the instrument's sensitivity in capturing genuine variation in competence.

3.2 Readiness Profile by Dimension: Positive Attitude as a Strong Initial Asset

All four dimensions fell into the High category. Attitudes/perceptions toward AI recorded the highest score (M=4.19), while pedagogical competence in AI–PAI integration recorded the lowest score (M=3.86) — a descriptive difference of 0.33 points between the

two. No inferential statistical test was conducted to determine whether this difference is statistically significant; it is reported purely as a descriptive pattern.

Table 2. Mean Scores by Dimension (N=74)

Dimension	Mean	SD	Category
Attitudes/Perceptions toward AI	4.19	0.96	High
Basic AI Literacy and Skills	4.01	1.05	High
Institutional and Facility Support	3.87	1.00	High
Pedagogical Competence in AI–PAI Integration	3.86	1.07	High
Overall Mean	**3.99**	**0.94**	**High**

This highest score on the attitude/perception dimension indicates that PAI teachers in this sample generally hold a high degree of openness and optimism regarding AI's role in education. This finding is consistent with patterns reported in AI-readiness studies across various other contexts, where the affective/attitude dimension consistently outperforms knowledge and practice [8], [9], [28]. Such positive attitudes represent an important initial asset, as technology-acceptance frameworks hold that favorable attitudes are a prerequisite for usage intention [20]. However, as the item-level findings below show, attitude alone does not guarantee the technical competence needed to implement AI meaningfully in teaching.

3.3 Item-Level Findings and the Gap between Attitude and Pedagogical Competence

Table 3. Mean Scores by Item (N=74), ordered from highest to lowest

Item	Mean	SD	Category
Open to technology-based innovation in education	4.36	1.05	Very High
Believes AI can help teachers understand student needs	4.22	0.98	High
Interested in using AI in teaching and learning activities	4.16	1.07	High
Believes AI can improve the effectiveness of PAI learning	4.15	1.04	High
Feels AI is an important part of the future of education	4.08	1.04	High
Comfortable using new technology (AI) in learning	4.05	1.08	High
Has a basic understanding of AI concepts	4.05	1.12	High
Has previously used digital (AI) technology in teaching	4.00	1.21	High
Receives support from school in using AI	3.97	1.05	High
Able to operate AI-based tools (ChatGPT, etc.)	3.92	1.13	High
Able to select AI technology appropriate for PAI	3.92	1.13	High
Understands the ethics of AI use in religious education	3.92	1.07	High
Institution provides AI-related training/workshops	3.84	1.22	High
Has access to supporting technology facilities	3.81	1.08	High
Able to design PAI instruction that integrates AI	3.76	1.13	High

The highest-scoring item was general openness to technological innovation (M=4.36), while the lowest-scoring item among all 15 items was the ability to design AI-integrated PAI instruction (M=3.76) — an item within the Pedagogical Competence dimension. This item-level pattern reinforces the dimension-level findings: general openness and attitude sit at the top of the distribution, while the most specific and applied pedagogical skills sit at the bottom.

This gap between teachers' affective enthusiasm toward AI and their self-reported applied ability to actually design AI-based instruction is the most significant finding of this study, and is not a new phenomenon: the TPACK framework holds that genuine technology-

integration competence requires the simultaneous interaction of content, pedagogical, and technological knowledge [16], [17] — a far more demanding achievement than simply holding a positive attitude or basic technical literacy. Chiu et al. [18] similarly argue that teachers' AI self-efficacy is conceptually distinct from attitude and must be built through repeated applied practice, not mere conceptual exposure. PAI teachers are required not only to competently operate AI tools, but also to design instructional scenarios aligned with religious learning outcomes while preserving the authenticity of Islamic values [3], [24]. This finding echoes the large-scale UAE study in which classroom-practice scores lagged far behind attitude and knowledge scores [8], the study of university language instructors whose generative AI readiness was constrained by inadequate institutional support [21], and the study of Indonesian Muslim university students whose positive attitudes toward AI in religious learning were not matched by equivalent actual use [23]. This recurring cross-context pattern confirms that knowledge or technical skill does not automatically translate into pedagogical competence without structured, practice-oriented training explicitly targeting classroom application.

3.4 Basic AI Literacy: A Solid Asset Not Yet Fully Transferred

The basic AI literacy and skills dimension ranked second highest (M=4.01), indicating that PAI teachers in this sample are generally fairly familiar with basic AI concepts and able to operate popular AI tools such as ChatGPT. This relatively strong technical literacy, however, has not been matched by an equivalent level of pedagogical competence, indicating that technical ability to operate AI tools does not automatically produce the ability to design well-integrated instruction. Nguyen and Habók [29], in a systematic review of 33 teacher digital-literacy assessment instruments, similarly found that most existing instruments measure literacy as an operational technical skill and rarely extend to applied pedagogical competence — a conceptual gap reflected in this study's empirical results.

3.5 Institutional Support and Practical Implications for Curriculum Development

The institutional and facility support dimension ranked third (M=3.87). This finding reinforces Achruh et al.'s [5] identification of infrastructure limitations and uneven institutional training as major barriers to AI adoption in Islamic education in Indonesia. It aligns with the readiness framework proposed by Angadi and Karan [19], which positions organizational factors as a key determinant of successful school-level AI adoption. It is also consistent with observations within the Muhammadiyah education context, where AI's positive contribution to learning depends on institutions actively guiding its use rather than allowing unsupervised adoption [7]. Given that this dimension correlates descriptively with pedagogical competence, strengthening institutional support — particularly practice-oriented training — represents a promising intervention pathway for closing the identified pedagogical competence gap.

Overall, PAI teachers in this sample reported highly open attitudes toward AI and fairly solid basic literacy, but self-assessed pedagogical competence in designing AI-based PAI instruction was the lowest of the four dimensions measured. On this basis, MPAI

curriculum recommendations need to be formulated more concretely, clearly distinguishing four different competence levels: basic AI literacy, pedagogical design, religious content verification, and ethical governance. Recommended MPAI learning activities include: (1) verification of AI-generated religious content, (2) AI-assisted lesson plan (RPP) design, (3) critical prompting workshops, (4) ethical scenario analysis, (5) peer review of AI-generated teaching materials, (6) classroom simulations, (7) case analysis of AI-generated hallucinated Qur'anic or Hadith references, and (8) development of institution-level AI usage guidelines. It is important to emphasize that these curriculum recommendations should not be based solely on a single self-report survey such as this study. More robust curriculum design requires triangulation with interviews, classroom observation, performance-based tasks, analysis of existing curricula, and consultation with stakeholders (course instructors, study program administrators, and partner school representatives). Theoretically, these findings reinforce the relevance of TPACK as extended to the generative AI era [16] for the religious education context, while also showing that technology-acceptance models emphasizing attitude and perceived usefulness alone are insufficient to explain genuine implementation readiness [20]. Practically, these findings recommend that the MPAI program at the UMSU Faculty of Islamic Studies and teacher-training policymakers shift emphasis away from merely building awareness and positive attitudes toward AI — which are comparatively already strong — toward strengthening applied pedagogical competence and technical self-efficacy [18], for example through practice-based instructional design workshops that explicitly integrate AI with PAI learning outcomes and ethical-religious considerations grounded in maqāṣid al-sharī'ah [4], delivered in a manner consistent with the institutional character of Muhammadiyah-based education [7].

3.6 Limitations and Implications

This study has several limitations that should be considered when interpreting its findings. First, the sample (N=74) was drawn from a single MPAI program at a single institution, so generalization to the broader population of PAI teachers in Indonesia should be approached with caution. Second, the instrument relies on self-report, which carries potential for social desirability bias, particularly on items measuring self-assessed attitude and competence — a potential that is heightened given that part of the questionnaire distribution was assisted by the MPAI Study Program in which respondents were enrolled. Third, this study did not collect demographic data such as age, gender, or years of teaching experience — variables shown in similar studies to moderate the relationship between readiness and AI implementation [8]; these variables could therefore not be analyzed here. Fourth, the research instrument had not undergone formal construct validity testing (e.g., exploratory factor analysis or expert judgment) prior to use, so interpretation of the measured dimensions should take this limitation into account. Fifth, the very high Cronbach's alpha values in several dimensions (>0.95) indicate possible item redundancy that should be addressed in future instrument development.

Despite these limitations, the findings carry meaningful theoretical and practical implications. Theoretically, the study reinforces the relevance of the TPACK framework as extended to the generative AI era [16], [17] within the distinctively ethical-theological

context of religious education, and demonstrates empirically that attitude-based technology-acceptance models alone [20] are insufficient to explain the gap between affective readiness and applied pedagogical competence. This gap appears consistently across international contexts [8], [9], [21], [23] but takes on particular significance in PAI given its dual mandate of technical integration and preservation of Islamic values [3], [4].

Practically, the findings recommend that the MPAI program at the UMSU Faculty of Islamic Studies and teacher-training policymakers shift emphasis away from merely reinforcing awareness and positive attitudes toward AI — which are comparatively already strong — toward strengthening applied pedagogical competence and technical self-efficacy [18]. This can be pursued through practice-based instructional design workshops that explicitly integrate AI with PAI learning outcomes and ethical-religious considerations grounded in maqāṣid al-sharī'ah [4], delivered in a manner consistent with the institutional character of Muhammadiyah-based education [7]. Concretely, it is recommended that: (1) training modules explicitly target competence in designing AI-integrated PAI instruction rather than merely introducing AI tools; (2) before this instrument is used in larger-scale research or structural modeling (e.g., SEM-PLS), it first undergo item refinement, content validation, pilot testing, and convergent/discriminant validity testing, since SEM-PLS should not be presented as a direct solution to current measurement weaknesses; (3) future research expand the sample across institutions and include demographic variables to enable more comprehensive between-group analysis; and (4) future research incorporate objective performance-based tasks and classroom observation evidence to complement self-report data, yielding a more valid picture of pedagogical competence than a single baseline survey can provide.

ACKNOWLEDGEMENTS

The authors would like to thank the Faculty of Islamic Studies, Universitas Muhammadiyah Sumatera Utara (UMSU), and the Master of Islamic Religious Education (MPAI) Study Program for facilitating access to respondents and assisting with questionnaire distribution during data collection. The authors also express their sincere gratitude to the 74 PAI teachers who voluntarily participated in this study for their time and willingness to share their perspectives. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

4. CONCLUSION

This study aimed to describe the self-reported readiness profile of PAI teachers for integrating AI into instruction across four dimensions. Based on the analysis of 74 respondents, all four readiness dimensions fell into the High category, ranked from highest to lowest: Attitudes/Perceptions toward AI (M=4.19), Basic AI Literacy and Skills (M=4.01), Institutional and Facility Support (M=3.87), and Pedagogical Competence in AI–PAI Integration (M=3.86). All instrument dimensions showed excellent reliability (Cronbach's alpha 0.871–0.973). The central finding of this study is the descriptive difference between teachers' highly positive affective attitudes toward AI and their self-

assessed applied pedagogical competence in designing AI-based PAI instruction — the lowest-scoring dimension overall.

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