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RESEARCH ARTICLE

Technological knowledge readiness in teaching Islamic education: A preliminary report of pre-service Islamic education teachers at Kulliyyah of Education, International Islamic University Malaysia

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Abstract - This preliminary study aimed to evaluate the level of technological knowledge readiness among pre-service Islamic education teachers at the Kulliyyah of Education (KOED), International Islamic University Malaysia (IIUM), to identify specific strengths and weaknesses within the components of technological readiness, and to analyse the gap between perceived readiness and the practical application of technology in teaching among pre-service Islamic education teachers at KOED, IIUM. Employing a quantitative survey design, data were collected from a total of 16 pre-service teachers using a structured questionnaire. Descriptive statistical analysis was used to interpret the data. Items were grouped into three dimensions: awareness of technology, skills of pre-service teachers, and pedagogical application. The findings indicate that participants demonstrated high readiness in awareness and technical skills, reflecting strong engagement with emerging technologies and confidence in selecting appropriate tools. However, pedagogical application scores were comparatively lower, highlighting a gap between conceptual understanding and practical classroom integration. These findings underscore the need for teacher education programs to move beyond surface-level technological familiarity and to provide structured, practice-oriented training that aligns digital competencies with pedagogical strategies and the ethical and instructional principles of Islamic Education.

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Introduction

The rapid advancement of educational technology has redefined pedagogical practices, requiring teachers to be adept in integrating digital tools for effective instruction. For pre-service Islamic Education teachers at the Kulliyyah of Education (KOED), International Islamic University Malaysia (IIUM), technological readiness is crucial in ensuring meaningful teaching and learning in both religious and contemporary contexts. However, concerns persist regarding their preparedness to utilize technology in delivering Islamic subjects, which traditionally rely on textual and discursive methodologies. This preliminary report examines the technological knowledge (TK) readiness among pre-service Islamic Education teachers at KOED. Technological Knowledge, as conceptualized in the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006), refers to educators' understanding of digital tools and their applications in instruction. Given the increasing demand for blended and online learning environments, especially in the post-pandemic era, assessing TK readiness is essential for identifying gaps and informing teacher education reforms. Despite the increasing emphasis on technological integration in education, existing studies continue to reveal a persistent gap between pre-service teachers perceived technological knowledge and their actual ability to apply such knowledge effectively within pedagogical contexts, particularly in Islamic Education settings. This finding is consistent with prior research, which suggests that possessing technological knowledge does not necessarily translate into meaningful pedagogical integration (Mishra & Koehler, 2006; Petko, 2012). Moreover, much of the existing literature has primarily focused on general technological readiness, with limited attention given to the depth of technology application, the quality of pedagogical integration, and the specific contextual challenges encountered by pre-service Islamic Education teachers. Therefore, a more critical and in-depth analysis is needed to move beyond surface-level readiness and examine how technological knowledge is meaningfully applied in teaching practice.

This study was conducted (1) to explore the level of technological knowledge readiness among pre-service Islamic education teachers at KOED, IIUM, (2) to identify specific strengths and weaknesses within the components of technological readiness, and (3) to analyse the gap between perceived readiness and the practical application of technology in teaching. Therefore, the research questions raised are: (1) What is the level of technological knowledge readiness among pre-service Islamic education teachers at KOED, IIUM? (2) What are the specific strengths and weaknesses in their technological readiness components? and (3) To what extent does a gap exist between their perceived readiness and the actual application of technology in teaching?

Literature Review

The integration of technology in education has become increasingly essential, especially within the context of Islamic education, where pre-service teachers must be prepared to adapt to a rapidly evolving digital setting. Technological knowledge readiness is not only digital competence but also the ability to effectively integrate technology into

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pedagogical practices and utilize digital tools in the teaching and learning process. This review critically explores how pre-service teachers are prepared to integrate technological knowledge with pedagogical practices that align with teaching Islamic education.

Technological Knowledge

The Technological Pedagogical Content Knowledge (TPACK) framework is an extension of the Pedagogical Content Knowledge (PCK) model introduced by Lee Shulman (1986). While Shulman emphasized the importance of integrating content and pedagogy in teaching, the TPACK framework, developed by Mishra and Koehler (2006), adds a third important element: technology. TPACK highlights the intersection of technology, pedagogy, and content, asserting that effective teaching requires not just expertise in subject matter and instructional methods, but also proficiency in selecting and utilizing appropriate technological tools. In the context of modern education, technological knowledge (TK) refers to the ability to understand, operate, and integrate technological tools such as digital platforms, interactive media, and online learning environments into the teaching and learning process (Tschönhens et al., 2024).

Teachers are now expected to navigate an increasingly digital educational landscape, requiring them to continually update their technological skills. For pre-service teachers, this necessitates a readiness to adapt to rapid technological changes and to implement innovative tech-based strategies to enhance student engagement and learning outcomes. Pandey and Malhotra (2025) concluded, based on conceptual analysis and case studies, that pre-service teachers do not receive any ICT training and, as a result, do not integrate technology into lesson design. Research by Khalid (2018) highlights that pre-service teachers often struggle to successfully integrate technology into their lessons, resulting in limited variety, depth, and capability. Similarly, a study by Bi et al. (2025) emphasizes the importance of immersive training environments that bridge the gap between theoretical knowledge and classroom practice. There is a pressing need for teacher education programs to provide hands-on experiences. Moreover, student teachers in the twenty-first century are likely to obtain ICT experience in classrooms during such fieldwork, which will improve their comprehension of the intricate relationship between digital technology and pedagogical expertise and content (Compton and Davis, 2010 as cited in Nordin et al., 2013). Critically, literature points to a persistent gap between technological awareness and practical readiness. Pre-service teachers often express anxiety and uncertainty about integrating digital tools into dynamic classroom settings. Tondeur et al. (2018) suggest embedding TK within pedagogical practices rather than treating it as a standalone skill. This approach enables more meaningful and sustainable technology use. A critical research gap exists regarding how in-service teachers in these settings apply and sustain digital competencies in post-pandemic face-to-face instruction (Hakim, 2025).

The potential of integrated technology-enhanced instruction is demonstrated by recent empirical examples in Islamic education. Although insufficient infrastructure continued to be a barrier, studies show that student engagement in religious studies increases when digital tools are incorporated into the classroom. For example, children's comprehension of recitation rules improved by 57.9% as impacted by an Augmented Reality Tajwid app (Premana, 2024). Furthermore, while the Qur'an is a central source text for Muslims, only limited research has been conducted on its specific pedagogical use within the digital classroom (Jannah, 2018). These case studies support the literature's argument for experiential, discipline-based instruction that combines innovative digital tools with religious content. There is also a lack of updated, structured overviews on how technology is currently being used to enhance the broader Islamic educational learning process (Ab Halim et al., 2025). In conclusion, TK is an evolving competency that must keep pace with technological innovation. Strengthening TK among pre-service teachers requires strategic curriculum design, experiential learning, and sustained institutional support. Future research should investigate longitudinal outcomes of TK-focused teacher training and the role of emerging technologies such as AR and AI in shaping the classroom of tomorrow.

Technological Knowledge Readiness of Pre-service Teachers

Technological Knowledge readiness plays a crucial role in preparing for today's digitally driven educational settings. Pre-service teachers are expected to acquire not only technical proficiency but also the capability to integrate technology with pedagogical and content knowledge. This need is especially significant in the context of Islamic education, where instruction must be both culturally appropriate and digitally enriched. This section presents recent research findings to highlight the importance of technological readiness among pre-service teachers in Islamic education, while also identifying gaps in the current literature and offering recommendations for future studies.

Technological readiness refers to the extent to which pre-service teachers possess the knowledge, confidence, and attitudes to effectively integrate technology into teaching. Readiness among pre-service teachers is a multifaceted concept that includes their knowledge, skills, attitudes, and confidence in undertaking teaching responsibilities effectively. According to Bakke et al. (2017, as cited in Hanim, 2024), readiness is a process that involves the integration of emotional, cognitive, and physical aspects in performing a task. In particular, readiness involves the extent to which these future educators are prepared to apply their content knowledge, pedagogical strategies, and technological skills in real classroom settings. Thus, the development of digital capabilities among teacher educators is a foundational aspect of technological readiness. Falloon (2020) emphasizes the need for a holistic understanding of Teacher Digital Competence (TDC), which is crucial for pre-service teachers in Islamic education. The proposed framework suggests that pre-service teachers must not only master educational applications but also blend pedagogical, content, and technological knowledge. This comprehensive preparation is essential for future educators who will encounter diverse, digitally mediated environments in their classrooms. Furthermore, the implications of interdisciplinary collaboration among faculty indicate that enhancing technological readiness requires a coordinated effort across various disciplines.

Focusing on digital literacy has also become essential, especially in the wake of the COVID-19 pandemic. Teachers' self-perception of their digital skills is significantly lacking, according to Sánchez-Cruzado et al. (2021), which emphasizes the need for the development of digital competence. Additionally, Thurzo et al. (2023) draw attention to differences in digital preparedness throughout institutions, emphasizing the necessity of uniform training in digital teaching techniques and communication. Attitudes and beliefs play a critical role in shaping pre-service teachers' readiness to integrate technology. Farjon et al. (2019) emphasize that prior experiences and positive attitudes significantly influence the extent to which pre-service teachers adopt technology in their teaching. Similarly, Lee and Lee (2014) demonstrated that building self-efficacy through structured lesson planning and hands-on practice increases the likelihood of future technology integration in the classroom. Additional factors such as perceived ICT competence, pedagogical understanding, and overall technology acceptance also contribute to readiness. Tejedor et al. (2020) argue that fostering these competencies is vital for meaningful and effective technology use in education. Furthermore, Koh and Divaharan (2011) highlight that the acceptance of educational AI tools is largely shaped by perceived ease of use and usefulness, both of which are essential components of teacher preparedness in a digital age. The findings of Wajhah and Mohd Yusof (2024) indicate that pre-service teachers demonstrated an average level of preparedness for technology integration, with a reported readiness score of 3.8. This mean score reflects a moderate yet reasonable level of readiness, suggesting that while pre-service teachers possess a foundational understanding of technology use in education, there is still room for improvement in terms of confidence and competence in implementing technology effectively in instructional settings.

Many teacher training institutions face fragmented and unequal conditions, leading to a gap between expected digital competencies and the actual support provided to pre-service teachers. Pre-service teachers frequently express low to moderate self-efficacy in incorporating technology into their teaching practices, despite their positive attitude. This implies a disconnect between their theoretical knowledge and their ability to use it practically (Eshete, 2023). The assumption that digital natives are naturally prepared to teach with technology is misleading, as familiarity does not equal pedagogical competence (Chen et al., 2010). Additionally, digital tools remain underused in programs that rely on traditional, lecture-based methods. To address this, teacher education must adopt a systemic approach: redesign curricula to include TPACK and project-based learning, improve digital access, and provide ongoing mentoring. In Islamic Education, digital integration should align with religious values while enhancing instructional quality. Technological readiness is a developmental process that requires active, equitable, and context-sensitive support. For Islamic Education, this means preparing teachers to use technology in ways that are both pedagogically effective and aligned with Islamic principles.

Methodology

Research Design

This preliminary study adopted a quantitative research design using a survey method to explore the level of technological readiness among pre-service Islamic Education teachers. A structured questionnaire was used to collect data, and descriptive analysis was conducted using SPSS Version 27.

Sample

The participants consisted of 16 pre-service Islamic Education teachers from the Kulliyyah of Education, IIUM. A convenience random sampling technique was used due to accessibility and relevance to the study's objectives. As a preliminary study, the sample size is limited; however, it provides initial insights and serves as a basis for future large-scale investigations.

Instrumentation

The structured question was adapted from Schmid et al. (2021) to measure Technological Knowledge Readiness, covering three dimensions, which are awareness of technology, skills of pre-service teachers, and pedagogical application, comprising 7 items (TKR1 to TKR7). Each item was rated on a 5-point Likert scale:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree

The questionnaire aimed to assess the respondents' confidence, ability, and preparedness in using technology for educational purposes.

Pilot Testing and Reliability

Prior to full data collection, a pilot test was conducted to examine the internal consistency of the Technological Readiness construct. Reliability was assessed using Cronbach's Alpha.

Table 1. Realibility coeeficient (Cronbach's Alpha) for technological knowledge readiness

Construct	No. of Items	Cronbach's Alpha
Technological Knowledge Readiness	7	.87

To determine the reliability of these items, Cronbach's Alpha was calculated using SPSS. The analysis produced an alpha coefficient of 0.870, indicating a high level of internal consistency. According to Hayat (2024) stated the instrument's

strong reliability for measuring the desired constructs is indicated by its coefficient of 0.870, which is essential for guaranteeing legitimate study findings.

Data Analysis

This study used descriptive analysis to examine the technological knowledge readiness of pre-service Islamic Education teachers by calculating the frequency, percentage, mean, and standard deviation for each item in the questionnaire.

Research Finding

Descriptive Statistics of Technological Knowledge Readiness

The technological knowledge readiness of the respondents was assessed through 7 items (1–7), each measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). A total of 16 pre-service Islamic Education teachers responded to the questionnaire. The analysis of data collected revealed an overall moderate to high level of technological knowledge (TK) readiness. Descriptive statistics, including frequency, percentage, mean scores, and standard deviations, were calculated for each survey item.

Table 2. Technological knowledge readiness

TKR No.	Statements	SD % (N)	D% (N)	N% (N)	A% (N)	SA% (N)	Means	Std. Deviation
1	I keep up with important new technologies.	-	-	-	56.3 (9)	43.8 (7)	4.44	0.51
2	I have the technical skills I need to use technology in teaching.	-	-	-	68.8 (11)	31.3 (5)	4.31	0.48
3	I know how technological developments have impacted to the Islamic education subject.	-	-	-	50.0 (8)	50.0 (8)	4.50	0.52
4	I can choose technologies that enhance the teaching approaches for a lesson.	-	-	-	62.5 (10)	37.5 (6)	4.37	0.50
5	I can design activities that encourage student interaction using technology.	-	-	6.3 (1)	43.8 (7)	50.0 (8)	4.44	0.63
6	I can use technology tools to foster higher-order thinking skills in students.	-	-	-	68.8 (11)	31.3 (5)	4.31	0.48
7	I use digital tools to provide immediate feedback to my students.	-	-	-	81.3 (13)	18.8 (3)	4.19	0.40

Overall, the results indicate that respondents exhibited moderate to high levels of technological knowledge readiness, with mean scores for all seven items exceeding 4.00. This suggests a generally positive self-assessment of technological competence among the participants. The item with the highest mean score was TKR3 ("I know how technological developments have impacted the Islamic Education subject") with a mean of 4.50 (SD = 0.52). The second-highest scores were observed in TKR1 ("I keep up with important new technologies") and TKR5 ("I can design activities that encourage student interaction using technology"), both with a mean of 4.44, though TKR5 showed a slightly higher standard deviation (SD = 0.63), suggesting a slightly broader range of responses. TKR1's high mean score also reflects a proactive attitude in staying informed about emerging technologies, a foundational trait of technologically literate educators. TKR2 ("I have the technical skills I need to use technology in teaching") and TKR6 ("I can use technology tools to foster higher-order thinking skills in students") both reported a mean score of 4.31, with relatively low standard deviations (SD = 0.48), indicating consistent agreement across respondents. TKR4 ("I can choose technologies that enhance the teaching approaches for a lesson") also had a high mean score of 4.37 (SD = 0.50), suggesting that pre-service teachers felt confident in selecting appropriate tools to support pedagogical strategies.

The item with the lowest mean score was TKR7 ("I use digital tools to provide immediate feedback to my students") at 4.19 (SD = 0.40). Although still above the neutral midpoint, this item reflects the least confidence among respondents, suggesting a potential gap in the use of real-time assessment technologies or formative feedback tools. Given the importance of timely feedback in effective teaching, this finding may indicate an area where additional training is needed. In terms of variability, standard deviation values ranged from 0.403 to 0.629, indicating a relatively tight clustering of responses, with most participants sharing similar perceptions of their technological readiness. The slight increase in variability for TKR5 may reflect differing levels of experience or confidence in designing technology-integrated activities.

Discussion

The objective of this preliminary study was to examine the technological knowledge readiness of pre-service Islamic Education teachers, to identify specific strengths and weaknesses within the components of technological readiness, and to analyse the gap between perceived readiness and the practical application of technology in teaching. Based on the descriptive analysis of 7 items, all mean scores were above 4.00 on a 5-point Likert scale, indicating a high level of technological readiness among the participants. This study contributes to the existing literature by highlighting the discrepancy between perceived technological readiness and actual pedagogical application in Islamic Education contexts.

It extends the TPACK framework by emphasizing the importance of aligning technological integration with religious and ethical considerations, particularly in response to the limited and fragmented research on how technology is meaningfully applied within Islamic educational settings.

Awareness of Technology

The highest mean score was recorded for TKR3 (M = 4.50, SD = 0.516), followed by TKR1 (M = 4.44), indicating strong awareness among participants regarding the relevance and impact of technology in Islamic Education, as well as their active engagement with emerging technologies. These findings suggest that pre-service teachers possess a high level of conceptual understanding and positive attitudes toward technological integration. Susilowati et al. (2023) viewed these technologies as ensuring effective and efficient learning by supporting a range of educational tasks, such as design, development, and assessment.

This strong awareness aligns with the TPACK framework, which emphasizes the importance of understanding the role of technology in enhancing teaching practices (Mishra & Koehler, 2006). However, while awareness is high, it does not necessarily indicate depth in pedagogical application. This supports existing concerns that technological knowledge at the awareness level may remain superficial without sufficient opportunities for contextual and practical application.

More importantly, this finding reflects a broader issue highlighted in the literature, where there is still limited understanding of how such awareness is translated into sustained classroom practices, particularly in post-pandemic face-to-face settings. As noted by recent studies, challenges remain in applying and sustaining digital competencies beyond conceptual familiarity, suggesting that awareness alone is insufficient to ensure meaningful integration in real teaching contexts as mentioned by Pandey and Malhotra (2025) previously.

Skills of Pre-Service Teachers

The results of TKR2 and TKR4 indicate that pre-service teachers demonstrate confidence in their technical skills and their ability to select appropriate technologies to support teaching. The high mean scores suggest a foundational level of digital competence and the ability to make informed decisions regarding technological tools. Tondeur et al. (2018) argue that embedding technological knowledge within pedagogical strategies is essential for sustainable integration. However, although these findings indicate strong self-perceived competence, they may not fully reflect actual classroom readiness. As observed by Sánchez-Cruzado et al. (2021), there is often a discrepancy between self-evaluation and actual digital literacy. This suggests that while pre-service teachers feel confident in their abilities, their skills may still be limited to operational or functional use rather than deeper pedagogical integration. In the context of Islamic Education, this limitation becomes more critical, as effective technology use requires not only technical proficiency but also the ability to align instructional strategies with religious content and values. Technology integration must be consistent with Islamic principles, which may make its acceptance more difficult in some situations (Yunita & Mulyadi, 2024). This is particularly relevant given the limited research on how core Islamic content, such as Qur'anic instruction, is pedagogically integrated within digital environments. As such, technical skills alone are insufficient without the ability to translate them into meaningful, context-sensitive teaching practices.

Pedagogical Application

The pedagogical application dimension reveals more nuanced findings. While TKR5 and TKR6 indicate that pre-service teachers are confident in designing interactive activities and fostering higher-order thinking skills using technology, TKR7 (M = 4.19, SD = 0.403) recorded the lowest mean score, particularly in the use of digital tools for immediate feedback. This suggests that although participants are able to conceptualize technology-enhanced learning, they face challenges in applying it in more complex and practical teaching scenarios. Perifanou et al. (2021) found that many educators struggle with using digital technologies for assessment and feedback, often due to limited experience with advanced features and real-time classroom application. The slightly higher variability observed in TKR5 also indicates differences in participants' exposure to designing technology-integrated activities, supporting the argument that experiential learning plays a crucial role in bridging the gap between theory and practice (Compton & Davis, 2010). While confidence in promoting higher-order thinking (TKR6) aligns with 21st-century educational goals, its actual implementation in Islamic Education contexts may require more structured training and guided practice.

More critically, these findings reinforce the existence of a gap between technological awareness and pedagogical application. While pre-service teachers demonstrate readiness at a conceptual level, their ability to implement technology in ways that are pedagogically meaningful and contextually appropriate remains limited. This supports the argument that, despite the growing attention to technological integration, current literature still lacks comprehensive and updated insights into how technology is effectively utilized to enhance Islamic educational learning processes in real classroom settings. Existing studies highlight that while pre-service teachers may possess foundational technological knowledge, there remains a persistent gap between theoretical understanding and practical application, particularly in the context of culturally and religiously sensitive instruction (Pandey & Malhotra, 2025; Khalid, 2018; Bi et al., 2025). Moreover, most research has focused on general technological readiness or isolated competencies, with limited attention given to holistic integration of technology, pedagogy, and content within Islamic Education classrooms, underscoring the need for experiential, context-specific, and updated investigations.

Bridging the Gap

These findings support previous research showing that younger pre-service teachers, particularly digital natives, tend to have high confidence in using technology (Teo, 2011; Sang et al., 2010). Compared to Hanim's (2024) study, which found moderate readiness, this study indicates a higher level of perceived readiness. However, this confidence may be overly optimistic. Although students report high readiness, there is a critical gap between awareness and pedagogical application, indicating that technological competence may remain at a surface level and require structured intervention. This gap reflects a broader issue in literature, where technological readiness is often assessed in terms of self-perception rather than actual classroom performance. Furthermore, while the integration of technology in Islamic Education shows promising potential, the lack of structured and updated frameworks for its implementation highlights the need for more systematic and context-specific research. This includes understanding how technology can be aligned with Islamic pedagogical principles, ethical considerations, and core content such as Qur'anic instruction. While the high mean scores suggest a positive perception of technological readiness, critical analysis invites caution. A key issue lies in the nature of readiness: are participants merely familiar with using devices, or are they pedagogically competent in integrating technology into Islamic teaching practices? The Likert-scale responses may capture self-perception, but not necessarily actual competence or contextual application. For instance, a high score on "using educational software" does not confirm the ability to design Shariah-compliant digital learning materials or ethically apply technology in religious instruction.

In addition, the internal consistency of the instrument was found to be very good, with a Cronbach's Alpha of 0.870, confirming the reliability of the construct. However, the relatively low standard deviations (0.403–0.629) may indicate homogeneity in the sample, likely due to shared institutional background. This limits the generalizability of the findings. From a critical perspective, the results may also reflect an optimistic bias common in self-report studies, where participants tend to overestimate their competencies due to social desirability or limited exposure to complex classroom realities (Teo, 2011). This is particularly relevant in Islamic Education, where effective technology integration requires not only technical skills but also alignment with pedagogical, ethical, and spiritual dimensions.

Conclusions

The findings of this study indicate that while pre-service Islamic Education teachers demonstrate a high level of technological knowledge readiness in terms of awareness and basic technical skills, a clear gap remains between their knowledge of technology and its effective pedagogical application in teaching and learning contexts. This supports the broader concern highlighted in the literature that technological competence does not automatically translate into meaningful instructional practice, particularly within discipline-specific contexts such as Islamic Education. More importantly, this study contributes to addressing several critical gaps identified in the literature. First, it provides empirical insight into how technological readiness is manifested among pre-service teachers, responding to the limited understanding of how digital competencies are sustained and applied in post-pandemic educational settings. Second, it highlights the lack of depth in the pedagogical integration of core Islamic content, such as Qur'anic instruction, within digital environments. Third, the findings reinforce the need for more structured and updated perspectives on how technology is effectively utilized to enhance the broader Islamic educational learning process. Although the overall findings are encouraging, particularly in areas such as technological awareness, staying updated with emerging tools, and designing student-centered activities, the results also reveal important limitations in more complex pedagogical practices. Specifically, lower confidence in using technology for immediate feedback and the variability in designing interactive activities suggest that pre-service teachers may lack sufficient exposure to authentic, practice-based experiences. This indicates that their readiness remains at a surface level, requiring deeper pedagogical development. In light of these findings, it is recommended that teacher education and professional development programs move beyond emphasizing general digital skills and instead focus on integrated, practice-oriented training. This includes strengthening pre-service teachers' competencies in using digital tools for formative assessment and feedback, designing interactive and engaging learning experiences, and applying higher-order thinking strategies through technology. Such training should be grounded in real classroom contexts to ensure that technological knowledge is translated into meaningful teaching practices.

Furthermore, it is essential to support pre-service teachers in developing a critical and reflective understanding of technology integration. This involves not only selecting appropriate tools but also evaluating their pedagogical value, aligning them with instructional goals, and ensuring their compatibility with Islamic ethical and spiritual principles. In this regard, technological knowledge readiness should not be viewed merely as technical proficiency, but as the ability to integrate digital resources within an Islamic pedagogical framework that is both contextually relevant and value-driven. This study also reinforces the argument that transferring ICT skills from personal use to pedagogical application is not automatic, but requires structured guidance, continuous practice, and subject-specific training (Chen et al., 2010). Therefore, teacher education programs must adopt a more holistic approach that integrates technological, pedagogical, and content knowledge in a coherent and sustained manner. Despite its contributions, this study is limited by its small sample size and focus on a single institutional context, which may affect the generalizability of the findings. Nevertheless, as a preliminary study, it provides important foundational insights into the technological readiness of pre-service Islamic Education teachers and highlights key areas for improvement. Future research should expand on this study by involving larger and more diverse samples, as well as employing more robust methodologies such as mixed methods or classroom-based observations to capture actual teaching practices. In addition, further investigation is needed to explore the ethical and pedagogical integration of emerging technologies, such as artificial intelligence and augmented reality, within Islamic Education. Such research is essential to develop a more comprehensive and context-sensitive understanding of technology integration that meets the evolving demands of 21st-century education.

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Conflict of Interest
The authors declare that there is no conflict of interest regarding the publication of this paper.

Author Contributions
Nabihah Husna Razali was responsible for the conceptualization of the study, development of the methodology, data collection, formal analysis, investigation, writing of the original draft, visualization, and editing of the manuscript.
Arifin Mamat contributed through supervision, validation, critical review, and editing of the manuscript, as well as providing overall guidance throughout the research process. All authors have read and approved the final version of the manuscript.

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