Jurnal Pendidikan Islam 16 (3) (2026) 376-395
DOI: 10.38073/jpi.5968
https://ejournal.uiidalwa.ac.id/index.php/jpi

p-ISSN: 2581-0065
e-ISSN: 2654-265X

Digital Learning Innovations in Islamic Education: A PRISMA Systematic Review and Bibliometric Analysis of Mobile Pedagogy through the Technology Acceptance Model

M. Azka Ibadillah[1*], Moh. Muchtarom[2], Relly Prihatin[3]
[1,2,3] Universitas Sebelas Maret, Surakarta, Indonesia
Email: azkaibadillah07@student.uns.ac.id[1], muhtarom1974@staff.uns.ac.id[2], relly.prihatin@staff.uns.ac.id[3]
*Corresponding Author

Article Information:
Received: 18 August 2026
Revised: 17 September 2026
Accepted: 21 September 2026
Published: 28 October 2026

Keywords:
Mobile Learning, Islamic Education, Technology Acceptance Model, Systematic Literature Review, Bibliometric Analysis.

Abstract

The post-pandemic digital transformation has underscored the urgency of integrating Educational Technology (EdTech) into Islamic Religious Education (PAI). However, this rapid adoption frequently encounters cultural resistance, primarily because current technological designs fail to replicate the essence of spiritual interaction; thus, a critical evaluation utilizing the Technology Acceptance Model (TAM) framework is imperative. This study aims to explore current trends and innovations, while simultaneously evaluating the acceptance levels of mobile learning-based pedagogical approaches within PAI. The methodology employs a Systematic Literature Review (SLR) adhering to PRISMA guidelines, integrated with a bibliometric analysis via VOS viewer on 20 core articles extracted from the Scopus database. Analytical results reveal a shift in publication trends, moving from emergency remote systems toward interactive innovations, including gamification, Mobile-Assisted Language Learning (MALL), and Problem-Based Learning (PBL). Furthermore, bibliometric mapping exposes a technocentric bias: existing research is heavily dominated by the measurement of technical instruments and perceived ease of use, thereby leaving a significant gap in pedagogical evaluation. Key findings highlight an effectiveness paradox: while mobile learning demonstrates high perceived usefulness in fostering cognitive skills, it fails to facilitate the transfer of affective-spiritual values inherent in the traditional *talaqqi* method a limitation further exacerbated by the digital divide and emerging cyber threats. In conclusion, future research should prioritize the design of blended learning models, the formulation of robust cyber ethics, and the development of an Extended TAM that incorporates Islamic socio-psychological variables. These steps are essential to ensure that technology is fully embraced as an effective medium for holistic character development.

How to Cite this Article: Ibadillah, M. A., Muchtarom, M., & Prihatin, R. (2026). Digital Learning Innovations in Islamic Education: A PRISMA Systematic Review and Bibliometric Analysis of Mobile Pedagogy through the Technology Acceptance Model. *Jurnal Pendidikan Islam*, *16*(3), 376–395. https://doi.org/10.38073/jpi.5968

INTRODUCTION

The COVID-19 pandemic has catalyzed an unprecedented digital transformation across the global education system, rendering Educational Technology (EdTech) an indispensable instrument for flexible and personalized learning (Gedam Kamalakar & K Kamala, 2025; S. Amiri, Prasun Goswami, M. Islam, Mohammad Sohel Kabir, & Mohammad Shakhawat Hossen, 2026). Within the specific landscape of Islamic education, this transformation necessitates the modernization of Islamic Religious Education (IRE) to

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ensure its relevance for the digital generation (Musytari Randa & Muhammad Arsyam, 2023)). While digitization has proven to significantly enhance educational accessibility (Azizeh Mukarromah, Abu Hasan Agus R, & Umar Manshur, 2025), this paradigm shift concurrently engenders a complex paradox of acceptance within the field. Widespread technological innovations frequently encounter cultural resistance, primarily because their current designs fail to replicate the nuanced spiritual interactions and character-building processes that are intrinsic to Islamic pedagogy. Consequently, employing an analytical approach grounded in the Technology Acceptance Model (TAM) framework is imperative. This framework highlights that educational tools must not only demonstrate high *perceived ease of use* but also deliver *perceived usefulness* that is strictly aligned with the preservation of authentic Islamic values and the holistic character development of students.

Consequently, the utilization of mobile-based media (*mobile learning*) has emerged as one of the most promising pedagogical innovations for navigating the complexities associated with technological integration. Existing literature corroborates that the deployment of mobile applications can transition the educational paradigm within *madrasah* settings toward a more modern, interactive, and student-centered approach (Agustian Sutrisno & Meti Fatimah, 2025; Nikmah, Supri, & Sri, 2025)). Explorations into specific instructional models, notably Mobile-Assisted Language Learning (MALL), have demonstrated empirical efficacy in facilitating the autonomous mastery of Arabic literacy across Islamic educational institutions (Dedi Rahman, Nur Dzul Rachman, & Arbain Arbain, 2026; Niya Erawati, Nunung Suryati, Ekaning Dewanti Laksmi, Suhono Suhono, & Risky Ba'da Mauludiyah, 2025; Rully Agung Yudhiantara & Andang Saehu, 2017). Within other cognitive domains, the integration of *mobile learning* grounded in Problem-Based Learning (PBL) provides a robust framework for connecting religious concepts with real-world problem-solving (Berliana, S. Nurkhasanah, Purnomo, & Dewi Rohmah, 2025). Although the contemporary literary landscape exhibits high enthusiasm for these cognitive innovations, comprehensive reviews mapping this scholarly domain remain notably scarce. This scarcity creates a critical research gap concerning the extent to which the acceptance of these mobile pedagogical innovations has been holistically evaluated within the Islamic education ecosystem.

To bridge this conceptual gap, conventional narrative reviews are deemed insufficient, as they are susceptible to subjective bias and fail to comprehensively map the dynamic landscape of existing literature. Consequently, this study introduces the integration of a Systematic Literature Review (SLR) approach, guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol (Page et al., 2021), with bibliometric analysis. Employing VOSviewer software for the bibliometric phase facilitates the objective quantitative visualization of publication trends, cross-national collaboration networks, and keyword co-occurrences (van Eck & Waltman, 2010). This rigorous methodological framework was specifically designed to extract high-impact literature from the Scopus database, accurately delineate the saturated research domain, and highlight critical research gaps concerning specific pedagogical variables. Furthermore, the empirical data extracted during this bibliometric phase is subsequently subjected to a critical analysis through the lens of the Technology Acceptance Model (TAM) (Davis, 1989). This step is crucial to uncover the underlying root causes particularly the technocentric bias driving the fluctuations in the acceptance of mobile pedagogical innovations across Islamic educational institutions.

The urgency of this research lies in the critical need to shift the discourse surrounding the development of *mobile learning* within Islamic Religious Education (IRE). Specifically, it necessitates a pivot from a technocentric focus which previously prioritized the

sophistication of application features toward a rigorous pedagogical evaluation that is measurable across both cognitive and socio-psychological dimensions. Through this comprehensive mapping, academics, Educational Technology (EdTech) developers, and policymakers will acquire a robust foundation for designing *mobile learning* instructional models that are not only highly usable but also deeply rooted in spiritual values. To guide the trajectory of this scientific inquiry, the literature synthesis is structured to address three primary research questions (*RQs): (1) Does the exploration of mobile learning-based instructional design in IRE remain a significant subject for future scientific investigation?; (2) How are current research efforts concerning these pedagogical innovations allocated and distributed?; and (3) What theoretical and practical implications can be recommended to advance the existing literature and expand technology adoption models within IRE in the future?*

Literature Review

Digital learning innovations within the field of Islamic education signify a fundamental paradigm shift, wherein mobile technology is no longer perceived merely as a passing trend, but rather as an indispensable tool whose success is heavily contingent upon user acceptance. This transformation effectively reconciles the rich traditions of Islamic pedagogy with the exigencies of the digital age, rendering religious knowledge more accessible without compromising its intrinsic value (Ahmad et al., 2025) Specifically**,** the utilization of seamless mobile learning media facilitates the holistic integration of Islamic values and science (Fahyuni, Bandono, & Arifin, 2020). Furthermore, this technological disruption compels Islamic Religious Education (PAI) teachers to adapt, leveraging mobile devices as instructional instruments to foster the realization of independent and autonomous learning (Thohir, Ma'arif, Junaedi, Huda, & Ahmadi, 2021).

The application of an appropriate instructional design model is vital to ensure that technology serves not merely as a conduit for information dissemination, but also demonstrates a high level of *perceived usefulness* in fostering structured cognitive understanding. Mobile-based pedagogical approaches, such as Problem-Based Learning (PBL), are meticulously designed to systematically instill character and religious values through the exploration and resolution of authentic problems (Zakaria & Nawi, 2020)). Furthermore, the integration of innovative design elements, notably mobile gamification, has proven highly effective in elevating student motivation and engagement with specific subjects via interactive simulation models (Saprudin et al., 2025). Within the context of language acquisition, the implementation of Mobile-Assisted Language Learning (MALL) delivers a personalized and communicative Arabic learning experience; however, the efficacy of its adoption is critically contingent upon the alignment of the application's design with the religious values and noble cultural traditions inherent to the *madrasah* (Idhan et al., 2026).

Moreover, this literature review underscores that the success of digital learning innovations is fundamentally dictated by socio-psychological dynamics operating within the framework of the Technology Acceptance Model (TAM). Active engagement within *blended learning* environments is driven not only by the *perceived ease of use* of the technology itself, but also by prevailing Islamic communal norms such as the traditional concept of *talaqqi* alongside the continuous guidance provided by educators (Puspitasari, 2026).

Building upon these dynamics, an examination of contemporary literature identifies a spectrum of operational challenges that empirically influence technology adoption rates. Studies addressing infrastructure gaps and the digital divide (Bunyamin, Umam, & Lismawati, 2020; Gedam Kamalakar & K Kamala, 2025; Sarkar, Das, Rahman, & Zobaer, 2021) corroborate that technical network constraints directly diminish the *perceived ease of use* of mobile applications. Furthermore, although these tools exhibit high *perceived usefulness* within the cognitive domain (Prayogi & Suhirman, 2023), this advantage is frequently overshadowed

by the risk of cyber threats, which precipitates adoption resistance within the family environment (Abdul Aziz, Sa'ari, & Wahab, 2023). This paradigm underscores the indispensable role of educators as value facilitators (Berliana et al., 2025), who are tasked with balancing technological innovation with essential affective guidance. Consequently, through a systematic review and bibliometric analysis, this study seeks to elucidate how various mobile-based pedagogical approaches interact with institutional readiness. This objective aligns with critical efforts to ensure that the adoption of *mobile learning* is fundamentally oriented toward enhancing the intrinsic quality of education, thereby consistently supporting the holistic development of students' character and competencies in the modern era.

Table 1. Definitions and Contributions of the Topic: Mobile Learning Innovations in Islamic Education

Author & Year	Article Title	Focus of the Pedagogical Approach	Definition / Contributions to Innovation in Islamic Education
(Ahmad et al., 2025)	Mobile Learning of Islamic Studies: A Comprehensive Review	Systematic Review (SLR) of Mobile Learning	Defining mobile learning (m-learning) as a transformative force that bridges pedagogical tradition and innovation, with the aim of making Islamic knowledge more accessible and relevant to contemporary learners.
(Fahyuni et al., 2020)	Integrating Islamic Values and Science for Millennial Students' Learning on Using Seamless Mobile Media	Seamless Mobile Learning & Guided Inquiry	Conceptualizing m-learning as a learning medium that transcends the boundaries of time and space and facilitates the integration of Islamic values and science, thereby encouraging millennial students to learn independently, interactively, and comprehensively.
(Zakaria & Nawi, 2020)	Design and Development of a PBL Mobile Application in Islamic Education: A Conceptual Framework	Mobile-Based Problem-Based Learning (PBL)	Describes an innovative approach to learning through the integration of problem-based learning (PBL) strategies into the development of mobile applications to instill the values of Islamic education in an interactive, systematic, and structured manner.
(Idhan et al., 2026)	Teachers' Experiences with Mobile Apps for Arabic Language Learning: Insights From Islamic Schools in Palu, Indonesia	*Mobile-Assisted Language Learning (MALL) & Konstruktivisme*	Defining MALL in the madrasah setting as a tool that facilitates personalized and interactive learning, where the effectiveness of its adoption is greatly influenced by the alignment between technology and the religious and cultural values of Islamic education.
(Puspitasari, 2026)	Factors Influencing the Active Engagement of Undergraduate Students in Blended Learning	*Blended Learning & Technology Acceptance Model (TAM)*	To analyze active engagement in Islamic higher education by integrating technology adoption (perceived ease of use) with social norms and communal values (such as Talaqqi and Jama'ah) to foster the intention to engage in digital learning behaviors.
(Saprudin et al., 2025)	The Use of Gamalama App to Improve Earthquake Disaster Mitigation Awareness in Islamic Junior High Schools	Gamifikasi Berbasis Seluler (Mobile Gamification)	Demonstrating digital design innovation through the incorporation of game elements (gamification) in mobile applications as a strategy to enhance cognitive engagement, motivation, and independent learning among madrasah students.

(Thohir et al., 2021)	From Disruption to Mobilization: IRE Teachers' Perspectives on Independent Learning Policy	Mobilization of Islamic Religious Education (PAI) Teachers	Positioning mobile learning devices and smart technologies not merely as communication tools, but as instruments of mobilization and empowerment for Islamic Education (PAI) teachers to adapt to disruption and support the "Merdeka Belajar" policy.
(Prayogi & Suhirman, 2023)	Problem-Based Learning Utilizing Assistive Virtual Simulation In Mobile Application To Improve Students' Critical Thinking Skills	Problem-Based Learning (PBL) & Cognitive Domains	This demonstrates that mobile apps have high perceived usefulness for the transfer of procedural knowledge, although they require additional strategies to address deficits in the affective and spiritual domains.
(Sarkar et al., 2021)	Perceptions Of Public University Students Towards Online Classes During COVID-19 Pandemic In Bangladesh	Accessibility of Mobile Learning and Blended Learning	The study found that gaps in network infrastructure directly reduce the perceived ease of use, and recommended the design of offline applications to overcome access barriers and preserve the talaqqi tradition.
(Abdul Aziz et al., 2023)	Cyber Security For Children: Parental Monitoring From A Technological, Child Psychology And Islamic Psychospiritual Perspective During The Covid-19 Pandemic	Cybersecurity Literacy & Digital Ethics	Highlighting the urgency of psychospiritual supervision (parental monitoring) and cyber ethics guidelines to mitigate the risk of digital addiction, which often triggers resistance from parents and hinders the adoption of technology.
(Bunyamin et al., 2020))	Critical Review Of M-Learning In Total Quality Management Classroom Practice In An Indonesian Private University	Implementation of an Emergency Mobile LMS	Analyzing the transition to adopting Mobile-LMS in the early stages of disruption, identifying technical bottlenecks that hinder ease of use, and emphasizing the importance of evaluating infrastructure before integrating learning solutions.
(Berliana et al., 2025)	Integrating Islamic Values And AI-Based Deep Learning: Implementation at SMK Negeri 1 Kebumen Towards Achieving Educational Sdgs	Quality of Education & Instilling Spiritual Values	Emphasizing that educators must take on a strategic role as facilitators of values to ensure that technological innovation is fully embraced as a medium for moral development, not merely as a cognitive tool.
(Agustian Sutrisno & Meti Fatimah, 2025)	Improving Islamic Religious Education Teachers' Pedagogical Competence Through Educational Technology Training: A Case Study in Surakarta Madrasah	Mobile App Integration & Madrasah Readiness	Analyzing the paradigm shift in learning at madrasahs through the adoption of mobile applications, emphasizing that perceived ease of use is greatly influenced by teacher training and infrastructure adaptation.
(Nikmah et al., 2025)	Teachers' Perceptions and Challenges in Implementing Digital-Based Islamic Learning In Madrasah: A Case Study At Mts Al-Kifayah	Student-Centered Mobile Learning	To evaluate the effectiveness of mobile learning in creating an interactive learning ecosystem, where technology adoption is driven by a high perceived usefulness in enhancing students' independent learning.

(Dedi Rahman et al., 2026)	Critical Reading Skill Development Through Mobile-Assisted Language Learning (MALL) Collaboration: A Needs Analysis	Mobile-Assisted Language Learning (MALL) & Independence	Demonstrating the effectiveness of the MALL model in facilitating self-directed Arabic language learning at Islamic higher education institutions shows the high level of student acceptance of interactive media.
(Niya Erawati et al., 2025)	A Systematic Literature Review on The Use Of MALL (Mobile-Assisted Language Learning) In English Learning And Teaching Process Across Educational Levels In Indonesia	MALL & Collaborative Learning	Developing a framework for integrating mobile learning to foster collaborative literacy, highlighting the importance of system design that supports communal interaction to enhance perceived usefulness.
(Azizeh Mukarromah et al., 2025)	Digital Transformation in Islamic Religious Education: Trend or Necessity In The Post-Pandemic Era	Digital Accessibility & Learning Engagement	Highlighting the positive correlation between the digitization of Islamic Education and improved access to learning, while also emphasizing the need for instructional design that can minimize cultural resistance.
(Musytari Randa & Muhammad Arsyam, 2023)	Transformation of Islamic Religious Education in the Revolution 4.0 Era	Modernizing Islamic Education and Character Development for the Digital Generation	Emphasizing the urgency of updating the PAI curriculum for the digital generation, it underscores that the acceptance of technology (adoption of innovation) absolutely requires a balance between relevant content and the preservation of holistic Islamic values.
(Rully Agung Yudhiantara & Andang Saehu, 2017)	Mobile-Assisted Language Learning (MALL) in Indonesian Islamic Higher Education	Introduction to Mobile-Assisted Language Learning (MALL)	To provide an initial empirical foundation regarding the implementation of MALL in Islamic educational institutions, demonstrating the high perceived usefulness of mobile devices in promoting autonomous and collaborative language literacy.
(Gedam Kamalakar & K Kamala, 2025)	Innovations in Educational Technology: Pedagogical Shifts in the Post-Pandemic World	Personalized Learning & EdTech Equity	Conceptualizing post-pandemic EdTech as a tool that offers flexibility, while also noting that unequal access to infrastructure can undermine the perceived ease of use and limit the potential for personalized learning.

METHOD

A systematic literature review, when integrated with a quantitative bibliometric approach, rigorously evaluates existing literature to identify key trends, patterns, and research entities within a specific scientific discipline. Employing a structured framework such as PRISMA guarantees a comprehensive and replicable review process, thereby presenting a transparent overview of the investigated topic (Marzi, Balzano, Caputo, & Pellegrini, 2025; Page et al., 2021). The established inclusion criteria for this study strictly consist of: (1) articles published up to June 20, 2026; (2) publications exclusively in English; and (3) a primary thematic focus on instructional design utilizing *mobile learning* within Islamic education. Subsequently, a bibliometric analysis was executed utilizing VOS viewer software to visualize bibliographic data, analyze citation networks, map author collaborations, and examine keyword co-occurrences. This computational phase is intended to uncover the intellectual structure and inherent dynamics of the research field. The amalgamation of bibliometric

analysis and a systematic review empowers researchers to synthesize empirical findings while holistically mapping the overarching landscape of scholarly activity (Kumar, 2025)). Integrating these methodologies yields a profound understanding of the field's development, historical trajectory, and prospective directions, rendering it exceptionally beneficial for extracting deeper insights within interdisciplinary studies. Furthermore, the systematic review phase of this investigation was specifically designed to transcend mere descriptive mapping. The extracted literature was critically evaluated through the theoretical lens of the Technology Acceptance Model (TAM) to comprehensively assess the efficacy and acceptance of these pedagogical innovations across both cognitive and affective-spiritual domains.

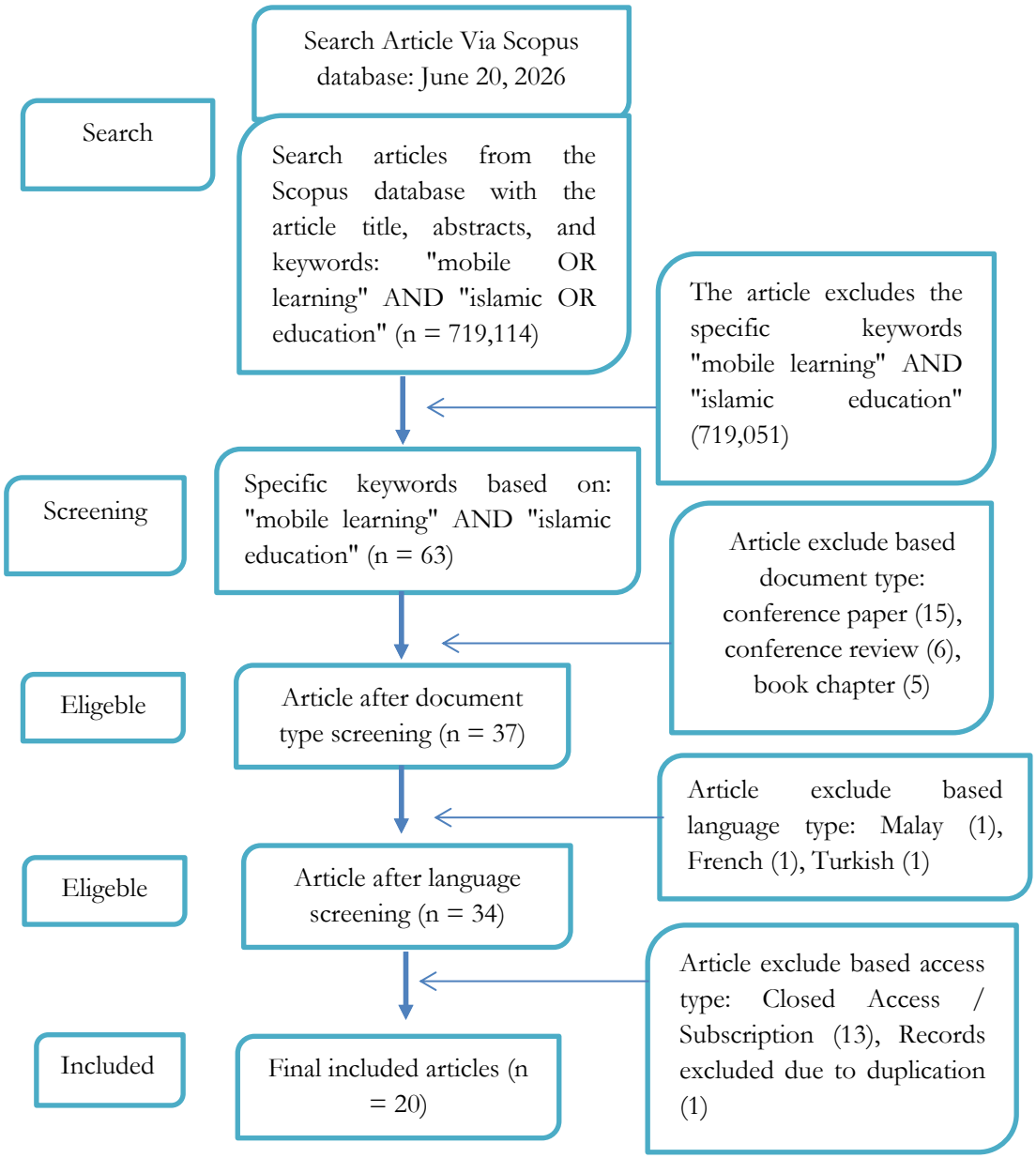


Figure 1. Systematic Literature Review information flow using PRISMA

The initial phase of this investigation entails a rigorous keyword selection process, employing a macro (top-down) methodology that progresses from a broad search scope to highly specific thematic areas. Consequently, to mitigate the limitations identified in prior

studies, this research strategically targets specific keyword clusters within the metadata fields (title, abstract, and keywords) of prospective articles. The search queries utilized a comprehensive combination of terms, notably *"mobile learning," "Islamic education,"* and *"instructional design."* Furthermore, the Scopus database was selected as the primary repository for data extraction. Its utilization is highly advantageous for conducting systematic reviews, identifying domain experts, and monitoring prevailing research trends, primarily due to its standardized indexing and capacity for reproducible Boolean searches (Gusenbauer & Haddaway, 2020). The entire literature selection procedure, encompassing the stages from initial identification to final inclusion, is systematically delineated in the PRISMA flowchart presented below.

The primary data extraction was executed on June 20, 2026, utilizing the Scopus database. The preliminary search employed a broad Boolean string applied to the metadata fields (title, abstract, and keywords): ("mobile" OR "learning") AND ("islamic" OR "education"). This initial query retrieved a vast corpus of 719,114 documents spanning various disciplines. To enhance search precision, the query was subsequently refined utilizing a more specific phrase ("mobile learning" AND "Islamic education") which successfully narrowed the results to 63 documents directly aligned with the core subject of this study (see Table 2).

Subsequent to this initial retrieval, a rigorous screening process was implemented to systematically exclude documents based on predefined classification criteria. Specifically, articles were eliminated based on document type (15 conference papers, 6 conference reviews, and 5 book chapters), publication language (3 non-English articles), and accessibility (13 restricted-access documents). Following this screening phase, one additional document was excluded upon being identified as a duplicate record within the Scopus indexing system, culminating in a final dataset of 20 core documents. These 20 documents were then subjected to an in-depth analysis to address the primary research questions: RQ1: Is the exploration of Mobile Learning-Based Instructional Design in Islamic Religious Education a subject that continues to hold significance for future scientific inquiry?; RQ2: What is the current distribution of research investigations related to Mobile Learning-Based Instructional Design in Islamic Religious Education?; and RQ3: What are the theoretical and practical implications from the perspective of future research on Mobile Learning-Based Instructional Design in Islamic Religious Education?

RESULTS AND DISCUSSION

The results of this study synthesize findings derived from 20 core articles indexed within the Scopus database, specifically concerning Mobile Learning-Based Instructional Design in Islamic Religious Education. The empirical data is established through the analysis of publication volumes, year-over-year publication trends, and journal sources. Furthermore, this section elucidates the most influential elements within this scholarly domain, encompassing key authors, institutional affiliations, and the contributing countries.

RQ1: Is the exploration of Mobile Learning-Based Instructional Design in Islamic Religious Education a subject that continues to hold significance for future scientific inquiry?

Data extracted from the Scopus database corroborates that the corpus of scholarly literature strictly integrating instructional design methodologies with *mobile learning* within the context of Islamic education comprises a mere 20 final articles. This scarcity indicates that rigorous investigations into the engineering of educational technology within this specific niche remain relatively limited; nevertheless, they demonstrate a highly dynamic and fluctuating developmental trend, as illustrated in Figure 1.

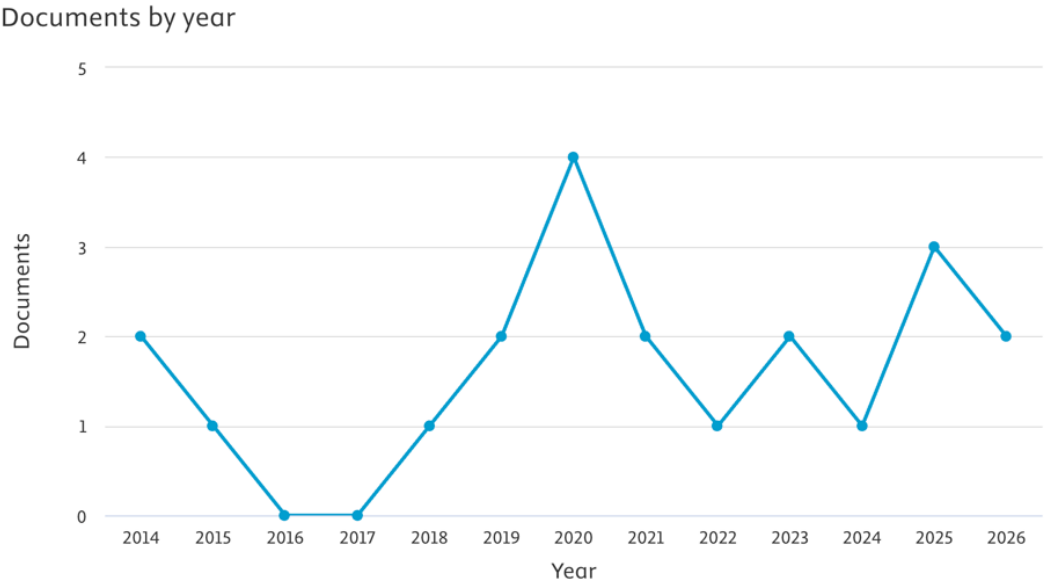


Figure 2. Number of Publications on Mobile Learning-Based Instructional Design in Islamic Education (2014–2026) *(Source: Scopus database)*

Table 2. TAM Coding Matrix for Mobile Learning in Islamic Education

TAM Constructs,Thematic Codes (Sub-themes),Representative Literature (from the 20 included articles)	Codes (Sub-themes)	Representative Literature (from the 20 included articles)
Perceived Usefulness (PU)	Cognitive Achievement: Enhancement of critical thinking, problem-solving (PBL), and autonomous literacy (MALL).	Prayogi & Suhirman (2023); Nikmah et al. (2025); Dedi Rahman et al. (2026); Zakaria & Nawi (2020)
	,"Spiritual & Moral Value Transfer: Integration of Islamic values, ethics, and character building within digital platforms.",	Ahmad et al. (2025); Fahyuni et al. (2020); Berliana et al. (2025); Musytari Randa & Arsyam (2023)
Perceived Ease of Use (PEOU)	Infrastructure & Accessibility: Bandwidth dependency, offline/blended access, and mitigation of the digital divide.",	Sarkar et al. (2021); Bunyamin et al. (2020); Gedam Kamalakar & Kamala (2025); Mukarromah et al. (2025)
	Institutional & Teacher Readiness: Digital literacy of educators, training, and adaptive policy implementation.	Thohir et al. (2021); Agustian Sutrisno & Meti Fatimah (2025);
External Variables (Socio-Psychological)	Cultural Resistance & Cyber Ethics: Lack of Talaqqi (face-to-face spiritual bonding), parental monitoring, and cyberbullying risks."	Abdul Aziz et al. (2023); Puspitasari (2026); Idhan et al. (2026); Saprudin et al. (2025)

Since its initial emergence in 2014 (comprising 2 documents) which was primarily limited to utilizing mobile phones for basic communication support publication trends have fluctuated. The literature reached its first peak in 2020 (4 documents) due to the systemic disruptions caused by the global pandemic. This surge was characterized by the adoption of Mobile-LMS frameworks (Fahyuni et al., 2020; Zakaria & Nawi, 2020), although their implementation was frequently hindered by technical bottlenecks ((Bunyamin et al., 2020;

Sarkar et al., 2021). Following a brief decline, the discourse experienced a significant resurgence during the 2025–2026 period (culminating in a second peak of 3 documents in 2025). This resurgence signifies a shift in academic focus: moving from mere emergency remote solutions toward the development of interactive applications, notably mobile gamification (Saprudin et al., 2025) and Mobile-Assisted Language Learning (MALL) (Idhan et al., 2026) The dynamics of these publication trends unequivocally address RQ1, concluding that the exploration of *mobile learning* design within Islamic Education retains crucial significance for future scientific inquiry. To mitigate post-hoc interpretive bias regarding these publication trends, this study systematically mapped the thematic focus of the included literature using a TAM coding matrix (Table 2). The thematic extraction reveals that the recent resurgence in interactive media—such as MALL and gamification—is fundamentally driven by the necessity to optimize *perceived ease of use* (overcoming early-pandemic technical barriers) and to maximize *perceived usefulness* in accommodating the dual cognitive-spiritual demands of Islamic education (Ahmad et al., 2025; Berliana et al., 2025).

RQ2: What is the current distribution of research studies related to Mobile Learning-Based Instructional Design in Islamic Religious Education?

An analysis of the research distribution concerning Mobile Learning-Based Instructional Design in Islamic Religious Education (PAI) across the 20 final articles was conducted by systematically categorizing the literature based on country, geographic region, institutional affiliation, journal source, and author. Acquiring a profound understanding of how scholarly works are distributed within this domain will substantially benefit academics and practitioners in delineating future research agendas, particularly concerning the continuous advancement of the digital Islamic instructional design paradigm.

First, examining the distribution of scholarly research by country or geographic region reveals a strong dominance by Indonesia, contributing 10 articles, followed by Malaysia with 8 articles. Other contributing nations include Brunei Darussalam and Pakistan (2 articles each), alongside Bangladesh, Egypt, Iran, Saudi Arabia, and the United States, each contributing a single article (see Figure 2).

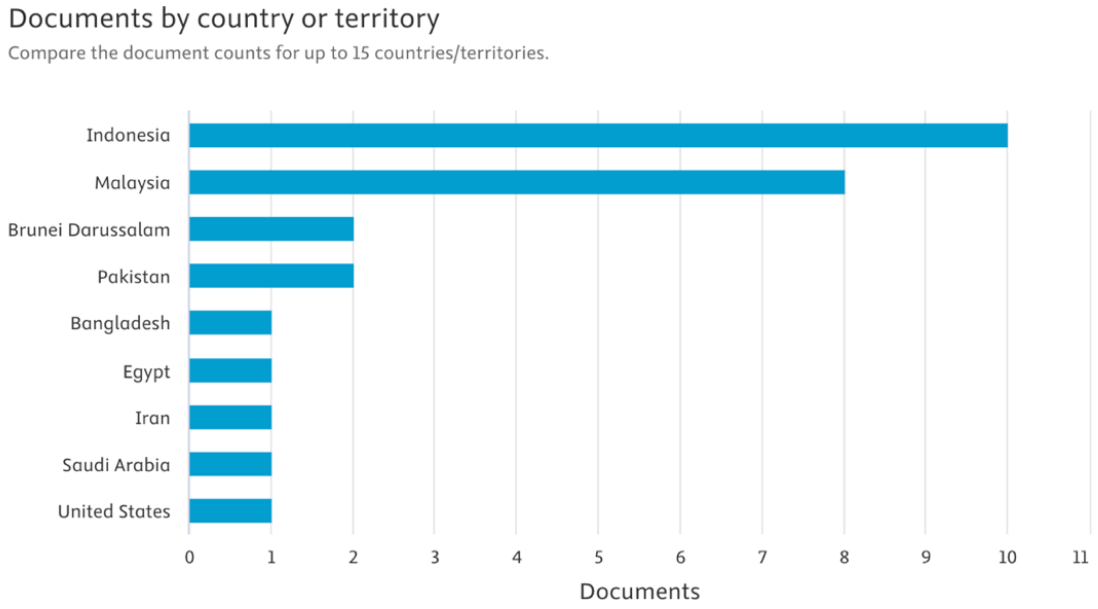


Figure 3. Number of articles by country or region *(Source: Scopus database)*

An analysis of the research distribution concerning Mobile Learning-Based Instructional Design in Islamic Religious Education (PAI) across the 20 final articles was executed by mapping the literature according to country/region, collaboration networks,

institutional affiliations, journal sources, and authors. As illustrated in the geographic distribution (Figure 2), the scholarly output is predominantly driven by Indonesia (10 articles) and Malaysia (8 articles), followed by Brunei Darussalam and Pakistan (2 articles each). Furthermore, individual contributions from the United States, Saudi Arabia, Iran, Egypt, and Bangladesh (1 article each) indicate that the discourse surrounding the adoption of Islamic educational technology is increasingly garnering global attention, transcending the boundaries of Muslim-majority nations.

Despite this global publication reach, a visualization of the cross-national collaboration network (*co-authorship*) generated via VOSviewer (Figure 3 reveals a highly exclusive centralization of research efforts. Robust collaboration is exclusively observed among three Southeast Asian nations Indonesia, Malaysia, and Brunei Darussalam which are interconnected within a single primary cluster. Examined through the theoretical lens of the Technology Acceptance Model (TAM), the insularity of this network highlights a critical research gap: it indicates that current evaluations of *perceived ease of use* and *perceived usefulness* regarding PAI mobile applications remain disproportionately tethered to the socio-cultural paradigms of this specific regional demographic. Consequently, it is strongly recommended that future research transcends these regional confines to comparatively validate the PAI technology acceptance model across diverse continental contexts.

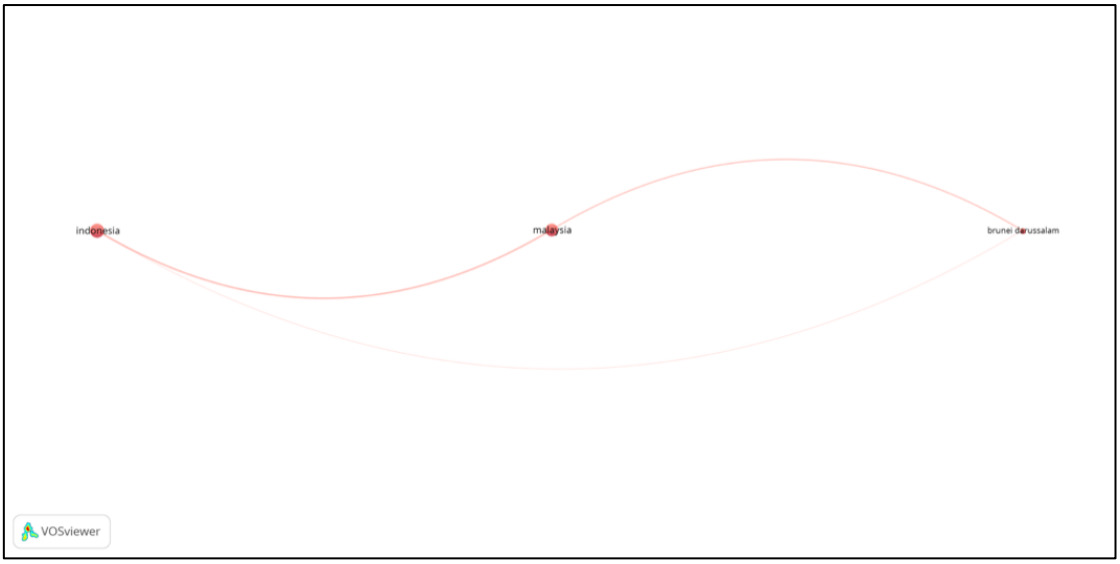


Figure 4. Visualization of the international collaboration network (co-authorship by country) *Source: Output VOSviewer Software*

Second, the mapping of institutional affiliations (Figure 4) reveals contrasting bibliometric dynamics. Peak productivity is attributed to six distinct institutions, each publishing two documents. This output is predominantly concentrated among universities situated on the Malay Peninsula (Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Universiti Teknologi MARA, and Universiti Malaya), followed by The Islamia University of Bahawalpur (Pakistan) and Universiti Brunei Darussalam. Conversely, although Indonesia cumulatively accounts for the highest volume of contributed articles, its institutional research productivity remains highly fragmented across numerous campuses, with each contributing merely a single document. This disparity indicates that Malaysia exhibits a significantly more centralized concentration of institutional research, thereby demonstrating greater consistency in advancing the engineering of Islamic digital learning design.

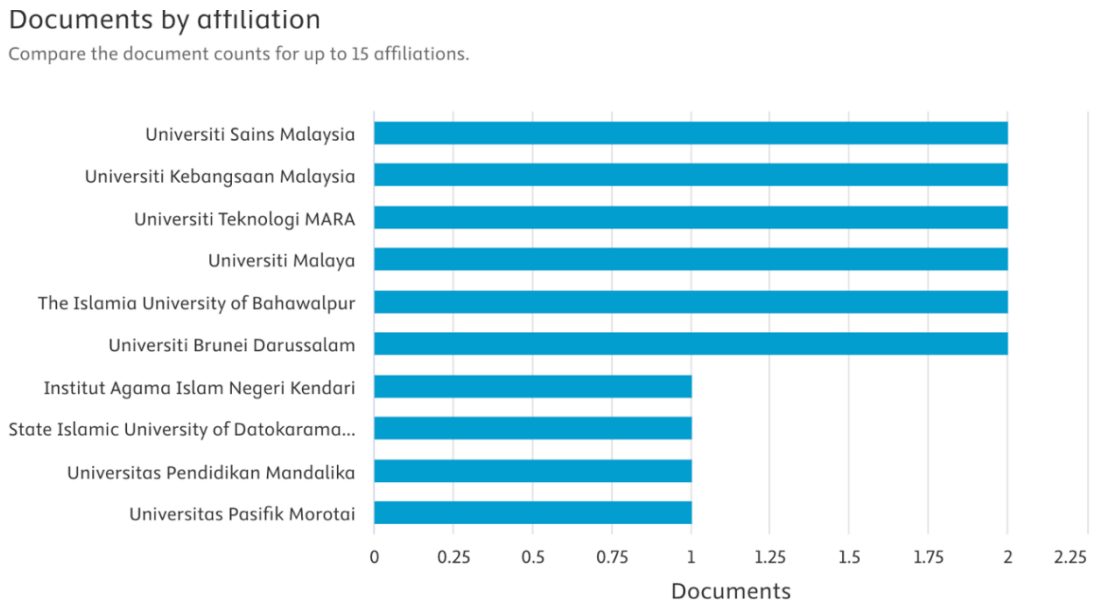


Figure 5. Number of articles by institutional affiliation (top 10) ***Source: Scopus database***

The findings derived from this institutional mapping reveal a compelling bibliometric dynamic. Although Indonesia accounts for the highest cumulative volume of publications (as depicted in Figure 4), its research productivity remains highly fragmented across multiple universities. Conversely, leading institutions in Malaysia demonstrate a markedly more centralized and consistent concentration of research efforts, actively shaping the scholarly discourse surrounding the engineering of Islamic digital learning design.

Third, an analysis of the research distribution concerning Mobile Learning-Based Instructional Design in Islamic Religious Education, categorized by journal sources, indicates a clear dominance by the *Turkish Online Journal of Distance Education* (3 articles) and the *International Journal of Interactive Mobile Technologies* (3 articles). This is subsequently followed by single-article contributions from a diverse array of publications, namely the *Asia Pacific Journal of Educators and Education*, *Cakrawala Pendidikan*, the *Bulletin of Electrical Engineering and Informatics*, the *Suranaree Journal of Social Science*, *BMC Medical Education*, *Civil Engineering and Architecture*, the *Journal of Advanced Research in Applied Sciences and Engineering Technology*, and *Afkar* (see Figure 5).

The diversity of publication titles and the expansive scope of these journals' academic focus reveal a highly significant finding: scholarly research on *mobile learning* within Islamic Education is not confined exclusively to the ecosystem of purely religious journals. Rather, this topic has been widely recognized as a dynamic, interdisciplinary field, actively extending into the realms of distance education, applied technology interactions, and computer engineering.

Fourth, an analysis of the research distribution concerning Mobile Learning-Based Instructional Design in Islamic Religious Education, categorized by authorship, is prominently led by Hussain, I. (2 articles) and Nawi, A. (2 articles). This leading output is subsequently followed by single-article contributions from a diverse array of scholars, namely Abd Elnaby, F.M.Z., Abd Halim, N.D., Abdul Aziz, N.A., Abdul Rahim, A.A., Achmad, R., Ahmad, K.A., Ahmad, S., and Ahmadi (see Figure 6).

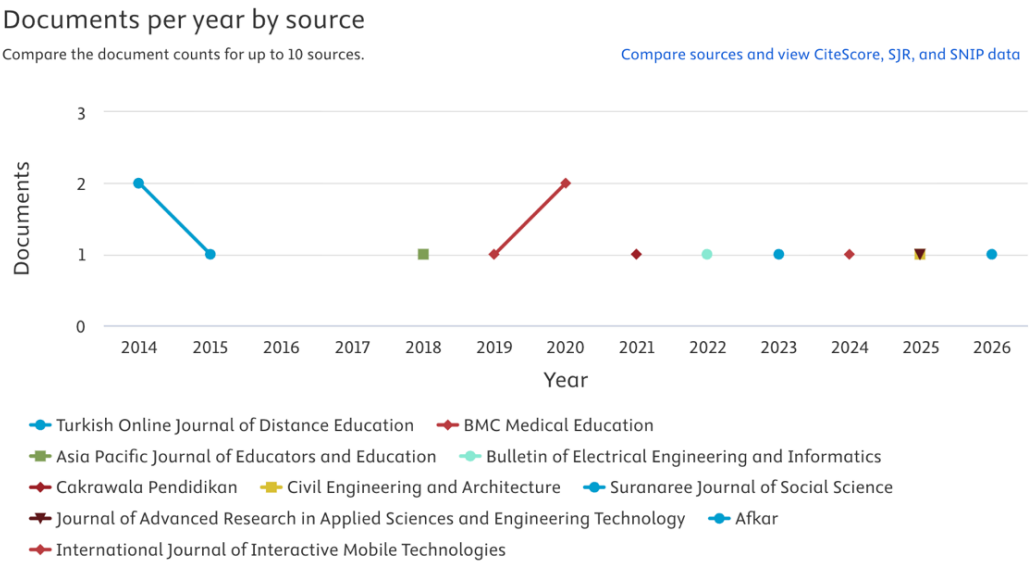


Figure 6. Trend in the number of documents per year by journal source (top 10) ***Source: Scopus database***

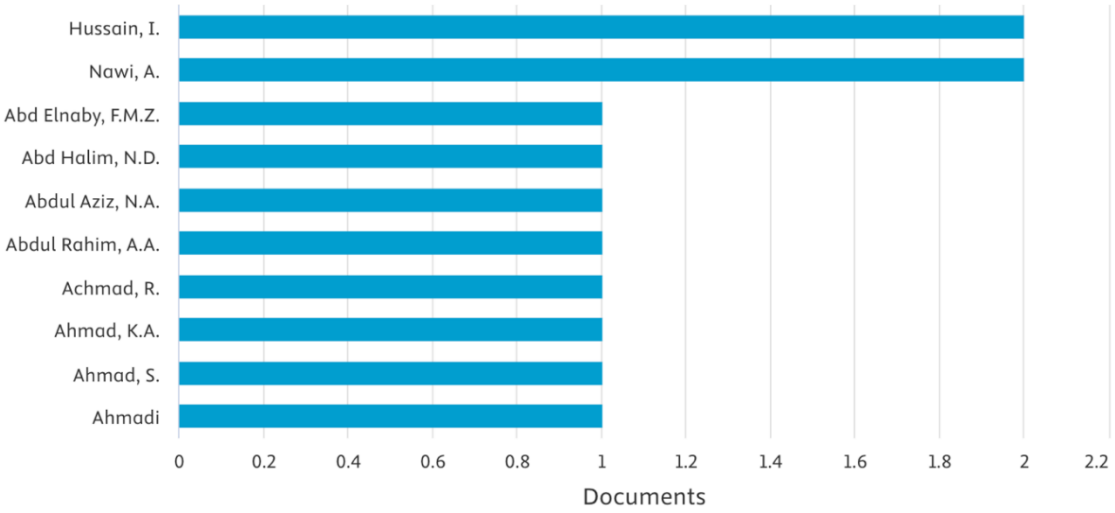


Figure 7. Number of articles by author (top 10) ***Source: Scopus database***

RQ3: What are the theoretical and practical implications of future research on mobile learning-based instructional design in Islamic religious education?

A comprehensive examination of 20 manuscripts extracted from the Scopus repository, facilitated by VOSviewer software, illustrates that the findings of this research yield far-reaching theoretical and practical implications for the future trajectory of mobile-based instructional design within Islamic Religious Education (PAI). Specifically, this metadata analysis and subsequent bibliometric mapping systematically dissect the variables that have been extensively investigated versus those that remain notably underexplored (van Eck & Waltman, 2010).

From a theoretical perspective, the outcomes of this mapping provide crucial guidance for scholars to identify critical research gaps, thereby enabling the expansion of the foundational framework of the Technology Acceptance Model (TAM) (Davis, 1989). To ensure this theoretical contribution is transparent and empirically derived, an Extended TAM Derivation Matrix (Table 3) was constructed based on the qualitative synthesis of the

included literature. This analysis underscores the urgency of recalibrating the technology acceptance construct. Previously, this construct exhibited a pronounced bias toward the measurement of technical instruments; however, driven by the persistent gaps in affective and moral integration identified in the systematic review, it must now pivot toward the development of an *Extended TAM*. As detailed in Table Y, this extended model must rigorously incorporate Islamic socio-psychological variables into those areas of the literature that currently suffer from an exploratory deficit (Scherer, Siddiq, & Tondeur, 2019; Taherdoost, 2018).

Table 3. Extended TAM Derivation Matrix for Islamic Education

Standard TAM Construct	Identified Literature Gap (Empirical Findings)	Proposed Extended Variable (Islamic Context)	Rationale & Supporting Literature
Perceived Usefulness (PU)	High success in procedural/cognitive transfer but fails to replicate spiritual interactions and moral cultivation.	**Perceived Spiritual Value & Talaqqi Compatibility**	PAI requires value transfer, not just knowledge. Mobile learning must be perceived as useful in maintaining the teacher-student spiritual bond (Sarkar et al., 2021; Berliana et al., 2025; Ahmad et al., 2025).
Perceived Ease of Use (PEOU)	Technical accessibility without ethical guidance exposes students to digital addiction, cyberbullying, and inappropriate content.	**Cyber Ethics Readiness & Parental Trust**	Ease of use is insufficient if it triggers cultural resistance or anxiety from parents/educators. Safe digital environments are a prerequisite for adoption (Abdul Aziz et al., 2023; Puspitasari, 2026).

Concurrently, from a practical standpoint, the identification of these literature gaps via VOSviewer establishes an objective foundation for educators and instructional developers. It is imperative to design *mobile learning* implementations that not only demonstrate excellence in *perceived ease of use* but also empirically validate a high degree of *perceived usefulness*. Crucially, this usefulness must strictly align with the preservation and cultivation of the learners' affective and spiritual values (Al-Emran, Mezhuyev, & Kamaludin, 2018).

Based on the keyword network visualization, the frequency of occurrence for specific terms is as follows: “mobile learning” (4), “mobile application” (3), “Islamic education” (3), “distance education” (2), “dual-mode university” (2), “educational technology” (2), “learning experience” (2), “viable approach” (2), “Islamic religious education” (2), “continuing education” (1), “continuous education” (1), “curriculum” (1), “education, continuing” (1), “learning” (1), “questionnaire” (1), and “satisfaction” (1) (see Figure 8).

Based on the mapping results presented in Table 2, a critical research gap can be descriptively identified through the distribution of author keywords. The prevailing research focus is heavily dominated by technological entities; specifically, the variables *“mobile learning”* and *“mobile application”* rank highest in total link strength (14), followed by the overarching academic domain of *“Islamic education”* (12). Conversely, specific variables pertaining to pedagogical and evaluative operational elements such as curriculum design, the learning process, and assessment instruments are positioned at the bottom of the top 10 keyword hierarchy. This pronounced disparity delineates the variables that have been extensively investigated versus those lacking proportional scholarly exploration. Furthermore, an analysis of the network visualization (Figure 9) corroborates a distinct cluster segregation

between technical entities (e.g., *"mobile applications"* within the red cluster) and Islamic education variables. Within the foundational framework of the Technology Acceptance Model (TAM), this visual and statistical bifurcation signifies that prior studies have been largely confined to measuring the *perceived ease of use* of technology. Crucially, they have not yet empirically integrated the evaluation of *perceived usefulness* within the curriculum. Consequently, this finding establishes an objective foundation for future researchers to pivot their investigations toward these underexplored pedagogical variables.

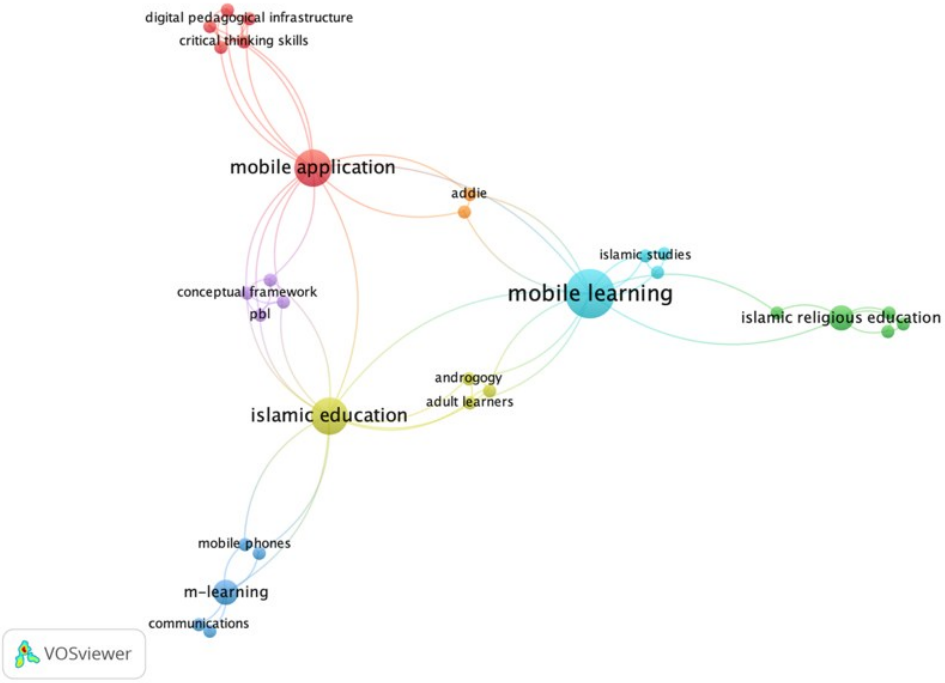


Figure 8. Network visualization based on the total strength of keyword links (*Source: Output analisis VOSviewer)*

Table 4. Keywords by authors

Rank	Keyword	Total link strength
1	Mobile Learning	14
2	Mobile Application	14
3	Islamic Education	12
4	Continuing Education	12
5	Continuous Education	12
6	Curriculum	12
7	Education, Continuing	12
8	Knowledge	12
9	Learning	12
10	Questionnaire	12

Source: Output VOSviewer software

Beyond the disparities observed in keyword distribution, an in-depth exploration of the articles' substantive content revealed a spectrum of conflicting findings concerning the efficacy of *mobile learning* within Islamic Religious Education. An evaluation of this effectiveness paradox is detailed in Table 4. To understand the genesis of these

contradictions, a comprehensive analysis was conducted, revealing that these divergent findings primarily stem from two fundamental factors:

Table 5. Analysis of Contradictions Regarding the Effectiveness of Mobile Learning in Islamic Education

Key Factors	Mobile Learning Capacity	Characteristics of Islamic Education	Root Causes & Impacts
The Dichotomy Between the Cognitive and Affective/Spiritual Domains	It is highly effective for the transfer of procedural and cognitive knowledge, as well as problem-solving simulations. (Prayogi & Suhirman, 2023)	It relies heavily on the transfer of values, etiquette, and spirituality, all of which absolutely require a physical presence. (Thohir et al., 2021)	Digital screens cannot fully replicate spiritual interactions. Paradoxically, apps are rated as having high Perceived Usefulness for cognitive aspects but low for affective aspects, leading to the perception that learning has become "devoid of value." (Sarkar et al., 2021)
The Infrastructure Gap and Digital Ethics Readiness	Its optimal operation depends on the stability of the internet connection (bandwidth) and the users' digital literacy. ((Sarkar et al., 2021)	They are often confronted with the reality of the digital divide and the need for psychospiritual supervision (parental monitoring) at home. ((Abdul Aziz et al., 2023)	Signal issues directly reduce the Perceived Ease of Use. Access without adherence to cyber ethics creates vulnerabilities to security threats and digital addiction (Abdul Aziz et al., 2023), which trigger resistance (reluctance to adopt technology) among educators and parents.

To understand the genesis of these contradictions, a comprehensive analysis of Table 4 reveals that the divergent findings regarding effectiveness are fundamentally anchored in two primary factors. First, there is a pronounced dichotomy between the cognitive and affective/spiritual domains. While mobile applications have successfully enhanced critical thinking skills (Prayogi & Suhirman, 2023)), they remain inadequate in substituting the essence of moral guidance traditionally imparted through face-to-face *talaqqi* methods (Sarkar et al., 2021). Evaluated through the lens of the Technology Acceptance Model (TAM), these applications meet the criteria for *perceived usefulness* within the cognitive sphere; however, they struggle to garner cultural acceptance due to notable deficits in the spiritual domain. Second, prevailing gaps in infrastructure alongside deficiencies in cybersecurity literacy culminate in operational ineffectiveness, particularly when students access the internet devoid of adequate psychospiritual supervision (Abdul Aziz et al., 2023). This latter factor directly diminishes the *perceived ease of use* due to technical network constraints and the proliferation of cyber threats. The reality of these conceptual and practical disparities generates highly significant theoretical and practical implications for future scholarly endeavors.

From a theoretical perspective, this mapping underscores the critical imperative to restructure conventional models of technology acceptance evaluation. Existing technology adoption models must evolve into an *Extended TAM* by formally integrating Islamic socio-psychological variables such as the belief in the blessings of knowledge (*barakah*), the centrality of the *talaqqi* concept, and the communal bond between educator and learner (*mudaris-talib*). Furthermore, future research must prioritize formulating novel instructional design frameworks capable of synthesizing the syntax of Problem-Based Learning ((Prayogi & Suhirman, 2023) with ethical and moral case studies. Such integration is essential to transform *mobile learning* from a mere technical problem-solving tool into a comprehensive medium for character development.

In practical terms, the outcomes of this analysis offer strategic direction for educators and Educational Technology (EdTech) developers. To optimize field usability, it is strongly recommended that developers engineer hybrid or *blended* applications capable of offline access, thereby mitigating the adverse impacts of network infrastructure disparities prevalent in rural areas. Moreover, to ensure a high degree of usability that remains congruent with Islamic values, policymakers and Islamic educational institutions must collaborate to establish comprehensive "Cyber Ethics" guidelines. These guidelines must seamlessly integrate digital security literacy with Islamic spiritual psychology. This ensures that students' autonomous learning remains safeguarded against cyber threats (Abdul Aziz et al., 2023), thereby preventing technology utilization within the home environment from triggering resistance or anxiety among educators and parents.

CONCLUSION

This study corroborates that the exploration of *mobile learning* design within Islamic Religious Education (PAI) represents a dynamic scholarly discourse that continues to evolve toward its ideal framework. The bibliometric analysis reveals fluctuating publication trends, reflecting a paradigm shift from the mere adoption of technology as an emergency stopgap measure toward the development of highly personalized, interactive media innovations. Furthermore, the systematic review demonstrates that the integration of pedagogical models, notably Problem-Based Learning (PBL) and Mobile-Assisted Language Learning (MALL), dominates the innovation landscape; these approaches have demonstrated empirical efficacy in significantly enhancing the *perceived usefulness* of technology in fostering students' cognitive skills.

Despite offering promising cognitive advancements, the literature synthesis and VOSviewer mapping expose a critical research gap characterized by a pronounced technocentric bias. Prior research has predominantly fixated on exploring technological instruments and *perceived ease of use*, resulting in a notable deficiency regarding pedagogical operational variables, such as curriculum design and assessment instruments. This imbalance engenders a profound effectiveness paradox within the field: while mobile applications successfully facilitate the transfer of procedural knowledge, they frequently encounter cultural rejection due to their inability to replicate the affective interactions and the transfer of spiritual values intrinsic to the traditional *talaqqi* method. Consequently, the trajectory of future research must pivot toward two fundamental imperatives: first, the conceptualization of *blended learning* models that effectively bridge digital cognitive skill acquisition with face-to-face moral guidance; and second, the formulation of an *Extended TAM* that formally accommodates Islamic socio-psychological variables. This theoretical expansion is critically necessary to ensure that educational technology is not merely adopted as a utilitarian technical tool, but is comprehensively embraced as a medium for holistic character development.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In the preparation of this manuscript, the author(s) utilized Google Gemini and Claude AI to assist with structural outlining, language refinement, and the translation of complex academic phrasing. All outputs were subsequently reviewed and revised by the author(s), who assume full responsibility for the final content of the publication.

AUTHOR CONTRIBUTION STATEMENT

M. Azka Ibadillah: Conceptualization, Methodology, Formal analysis, Data Curation, Writing - Original Draft. Mohammad Muchtarom; Relly Prihatin Supervision, Validation, Writing - Review & Editing.

FUNDING STATEMENT

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are derived from publicly available academic literature. The specific datasets (metadata) extracted and analyzed during this study are available from the Scopus database.

DECLARATION OF INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ACKNOWLEDGMENT

The author(s) would like to express profound gratitude to the master's program in Educational Technology at Universitas Sebelas Maret (UNS) for providing the academic ecosystem and support necessary to conduct this research.

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