Ta'dibuna Jurnal Pendidikan Islam
P-ISSN: 2252-5793
E-ISSN: 2622-7215
Vol. 15, No. 1, Februari 2026, hlm. 162-180
DOI: 10.32832/tadibuna.v15i1.22316
http://ejournal.uika-bogor.ac.id/index.php/TADIBUNA/

A Humanistic Pesantren Curriculum Model Based On Digital Technology For Strengthening 21st-Century Competencies

Arizqi Ihsan Pratama[1]*, Anas Fauzi[2], Muhd Rosyid Muhammad[3]
[1,2]Manajemen Pendidikan Islam, Universitas Darunnajah, Indonesia
[3] Departement of Information Systems, International Islamic University Malaysia, Malaysia
* anasfauzi@darunnajah.ac.id

Abstract

This study explores the integration of digital technologies into the of a humanistic pesantren curriculum aimed at strengthening 21st-century competencies. The primary objective is to examine how digital tools can enhance the learning experience in pesantren while preserving Islamic educational values. The research follows a Systematic Literature Review (SLR) approach, utilizing frameworks like Social Cognitive Theory, Technology Acceptance Model (TAM), and Institutional Theory to analyze (following PRISMA guidelines, analyzing 71 studies) existing studies from Southeast Asia, particularly Indonesia, and global perspectives on digital integration in Islamic education. The methodology involves synthesizing findings from a wide range of quantitative and qualitative studies, focusing on the challenges and benefits of digital technology in religious educational settings. The analysis identifies key themes such as digital leadership, technology adoption, and the integration of 21st-century skills like creativity, critical thinking, and collaboration. Notably, the findings reveal that while digital tools have enhanced engagement and academic outcomes, there remains a significant gap in understanding their long-term impact on students' religious identity and moral development. The integration of technology must align with Islamic values to ensure that it complements, rather than undermines, the core principles of religious education. This review offers a novel perspective by proposing a holistic and humanistic curriculum model that balances technology with religious teachings. Future research should focus on longitudinal studies to assess the long-term impact of technology on students' spiritual growth, as well as develop context-specific theoretical frameworks that address the unique challenges of digital integration in Islamic education. The findings underscore the importance of culturally grounded curriculum and policy development for sustainable digital transformation in Islamic education.

Keywords:*Humanistic Curriculum; Pesantren Curriculum; 21st Century Competencies; Islamic Education; Education Technology.*

Abstrak

Penelitian ini mengkaji integrasi teknologi digital dalam kurikulum pesantren humanistik untuk memperkuat kompetensi abad ke-21. Tujuan utama dari penelitian ini adalah untuk menganalisis bagaimana alat digital dapat meningkatkan pengalaman pembelajaran di pesantren sambil mempertahankan nilai-nilai pendidikan Islam. Penelitian ini menggunakan pendekatan

Diserahkan:11-12-2025 **Disetujui**: 23-03-2026. **Dipublikasikan**: 28-03-2026

Kutipan: Pratama, A. I., Fauzi, A., & Muhammad, M. R. (2026). A Humanistic Pesantren Curriculum Model Based On Digital Technology For Strengthening 21st-Century Competencies. Ta'dibuna Jurnal Pendidikan Islam, 15(1), 162–180. https://doi.org/10.32832/tadibuna.v15i1.22316

Systematic Literature Review (SLR) dengan memanfaatkan kerangka teori Social Cognitive Theory, Technology Acceptance Model (TAM), dan Institutional Theory untuk menganalisis studi-studi (dengan mengikuti pedoman PRISMA, menganalisis 71 studi) terkait dari Asia Tenggara, khususnya Indonesia, serta perspektif global tentang integrasi teknologi digital dalam pendidikan Islam. Metodologi yang digunakan melibatkan sintesis temuan dari berbagai studi kuantitatif dan kualitatif, dengan fokus pada tantangan dan manfaat teknologi digital dalam konteks pendidikan agama. Analisis ini mengidentifikasi tema-tema utama seperti kepemimpinan digital, adopsi teknologi, dan integrasi kompetensi abad ke-21 seperti kreativitas, berpikir kritis, dan kolaborasi. Menariknya, temuan ini menunjukkan bahwa meskipun alat digital dapat meningkatkan keterlibatan dan hasil akademik, masih ada kesenjangan yang signifikan dalam memahami dampak jangka panjangnya terhadap identitas agama dan perkembangan moral siswa. Integrasi teknologi harus selaras dengan nilai-nilai Islam untuk memastikan bahwa teknologi tersebut melengkapi, bukan merusak, prinsip dasar pendidikan agama. Review ini menawarkan perspektif baru dengan mengusulkan model kurikulum yang humanis dan holistik yang menyeimbangkan teknologi dengan ajaran agama. Penelitian masa depan harus fokus pada studi longitudinal untuk menilai dampak jangka panjang teknologi terhadap pertumbuhan spiritual siswa, serta mengembangkan kerangka teori kontekstual yang mengatasi tantangan unik dalam integrasi digital di pendidikan Islam. Temuan ini menekankan pentingnya kurikulum yang berbasis budaya dan pengembangan kebijakan untuk transformasi digital yang berkelanjutan dalam pendidikan Islam.

Kata kunci : Kurikulum Humanistik; Kurikulum Pesantren; Kompetensi Abad ke-21; Pendidikan Islam; Teknologi Pendidikan.

I. Introduction

In recent years, the integration of digital technology into education and social practices has attracted growing attention due to its significant role in shaping 21st-century competencies. Studies from 2020–2025 show that technology not only transforms learning and work but also opens opportunities for innovation and sustainable development. Mourlam et al. (2020) found that technology integration enhances student engagement and well-being, while AlAjmi (2022) emphasized the importance of digital leadership in ensuring successful school transformation during the COVID-19 pandemic. Yuan et al. (2025) further demonstrated how information technology integration supports corporate ESG performance and sustainable development goals.

In Islamic education, recent studies highlight the urgency of curriculum reform in response to digital transformation. Falaqi et al. (2025) argued that contemporary Islamic curricula should be grounded in relevant philosophical foundations, while Mahsusi et al. (2024) showed how digital management improves the quality and cultural sustainability of Indonesian madrasahs. Bakti et al. (2025) added that integrating Islamic values within technology-based inclusive education fosters sustainability. Collectively, these studies confirm that digital integration is no longer optional but essential for building inclusive and future-oriented education systems.

The rapid advancement of digital technology has shifted its role from a supporting tool to an integral component of curriculum and pedagogy. Preparing learners for the digital era requires competencies such as digital literacy, critical thinking, and collaboration (Niu et al., 2021; Zaragoza et al., 2019). The COVID-19 pandemic accelerated this shift but also exposed persistent challenges, including the digital divide, as shown in Li's (2024) study on TPACK disparities between urban and rural teachers. Technology integration has also expanded to pre-service teacher education, where digital equity-based approaches foster inclusive mindsets (Weisberg & Dawson, 2024). Moreover, Desmaryani et al. (2024) demonstrated that government MSME collaboration enhances digital literacy and broader socio-economic development.

Although previous reviews have examined the benefits and challenges of technology integration, important social and ethical dimensions remain underexplored. Statti & Torres (2020) highlighted technology's potential to enhance engagement but called for further research on training and resource disparities. Karakose et al. (2023) warned of risks such as misinformation in the use of ChatGPT. These findings indicate that while technological innovation offers substantial promise, its integration requires careful consideration of ethical and social implications. This study therefore proposes a more comprehensive framework for integrating emerging technologies, including generative AI and XR, into education. Addressing the limitations of prior research particularly its technical focus and limited attention to cultural, social, and ethical contexts this study aims to contribute both theoretically and practically to more holistic and responsible technology integration in education.

II. Research Method

This study employs the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which were first introduced by Moher et al. (2009). PRISMA is widely regarded as a gold standard for reporting systematic reviews and meta-analyses and has been applied across a diverse range of academic fields (Panic et al., 2013; Siddaway et al., 2019; ter Huurne et al., 2017). The PRISMA framework ensures a structured and transparent process, comprising distinct stages: identification, screening, eligibility, and inclusion. A visual representation of the PRISMA process can be found in Figure 1, which provides an overview of the article selection flow.

The literature search was systematically conducted using the Scopus database as the primary source, selected for its rigorous indexing of high-quality journals (Lasda Bergman, 2012; Rocha et al., 2020). The search was performed in the title, abstract, and keyword fields (TITLE-ABS-KEY) by combining four keyword groups using Boolean operators. The first group covered the Islamic education context (islamic education, pesantren, madrasah, islamic school. The second group focused on curriculum (curriculum, curriculum development, curriculum design, humanistic curriculum). The

third group addressed digital technology (digital technology, educational technology, technology integration, digital literacy, ict, information technology). The fourth group encompassed 21st-century competencies (21st century skills, 21st century competencies, critical thinking, creativity, collaboration, digital literacy). These four groups were connected with the AND operator to ensure that retrieved articles covered all research dimensions. The search was supplemented by manual searching in the Watase database (Wahyudi, 2024) to reach Indonesian local context studies, as well as reference list searching (snowballing) from relevant articles.

To ensure a systematic and transparent study selection process, inclusion and exclusion criteria were established a priori based on a modified PICOS (Population, Intervention, Comparison, Outcomes, Study design) framework adapted for this.

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Publication Period	2019-2025 (to capture recent post-COVID-19 developments)	Before 2019
Publication Type	Peer-reviewed journal articles	Conference proceedings, book chapters, policy reports, dissertations, editorials, opinion pieces
Journal Rank	Scopus-indexed Q1 or Q2	Non-Scopus or outside Q1/Q2
Language	English or Bahasa Indonesia	Other than English and Indonesian
Context	Islamic education (pesantren, madrasah, Islamic schools)	General education without Islamic focus
Focus	Digital technology integration in curriculum	Technology without curricular relevance
Study Type	Empirical studies (qualitative, quantitative, mixed-methods) and systematic reviews	Normative theoretical studies without empirical data
Availability	Abstract available and full text accessible	No abstract or full text unavailable

Study selection was conducted in four stages following the PRISMA 2020 protocol. Initially, 734 articles were identified through database searching (Scopus = 712, Watase = 22). After removing duplicates (n=6), title and abstract screening was conducted on 728 articles. At this stage, articles that did not meet the inclusion criteria based on publication

year (n=192), research focus (n=273), journal rank (n=135), and abstract availability (n=9) were excluded, leaving 119 articles for full-text retrieval.

Of the 119 articles sought for retrieval, 48 articles could not be accessed in full text. Thus, 71 articles were successfully retrieved and assessed for eligibility. All 71 articles met the inclusion criteria and were included in the final analysis. The complete PRISMA flow diagram illustrating the selection process is presented in Figure 1.

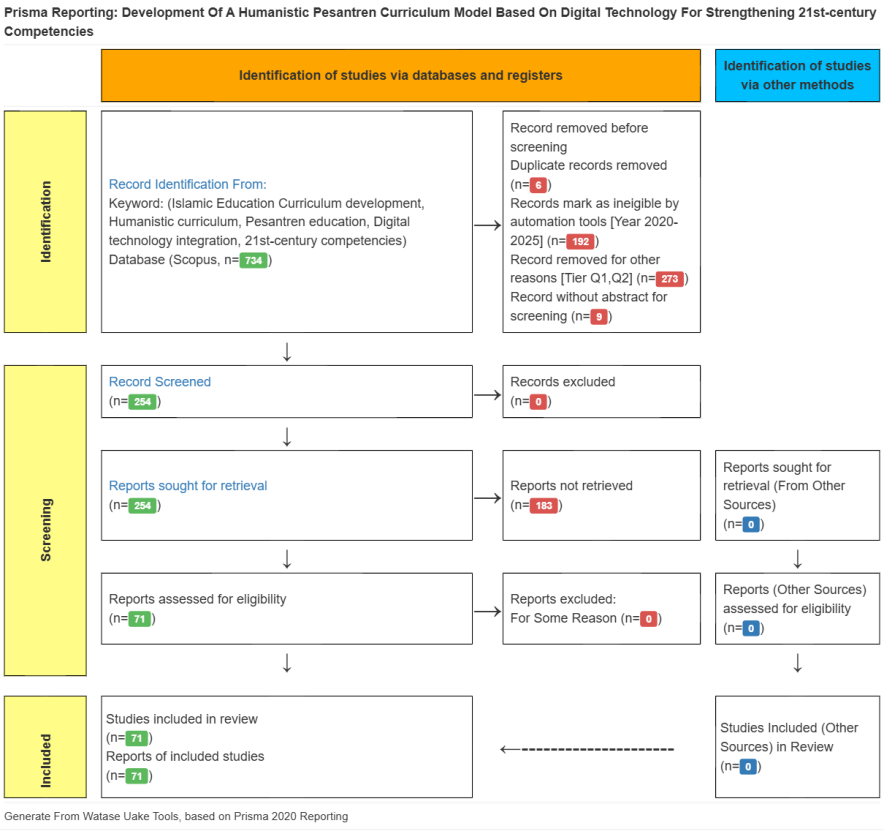

Figure 1. Diagram Illustrating The Selection Process With PRISMA

The first step, identification, involved an extensive search of academic databases using carefully selected keywords that were specifically tailored to the research focus. These included terms like Islamic Education Curriculum Development, Humanistic Curriculum, Pesantren Education, Digital Technology Integration, 21st-Century Competencies, and Educational Technology. The primary database used for this search was Scopus, chosen for its rigorous indexing process, which ensures access to high-quality scholarly articles (Lasda Bergman, 2012; Rocha et al., 2020). Scopus was preferred over alternatives like Google Scholar, as it avoids issues such as article duplication and the inclusion of sources that may lack academic rigor (Hariningsih et al., 2024). Additionally, the Watase database (Wahyudi, 2024) was used to supplement the search and guarantee a comprehensive set of relevant articles. Initially, 734 articles were identified through this search process.

Before progressing to the screening phase, a thorough pre-screening process was undertaken to eliminate any articles that did not meet the specified criteria. Specifically, duplicates were removed (6 articles), as well as articles that were deemed irrelevant based on their publication date (192 articles) or lack of alignment with the research focus. Additionally, 273 articles were excluded because they did not come from high-impact journals (Q1/Q2). Interestingly, 9 articles were discarded for not including abstracts, which are crucial for the screening process. As a result of these exclusions, 254 articles remained for the subsequent screening stage.

During the screening phase, the remaining 254 articles were carefully evaluated for both relevance and validity. This process involved assessing the articles for their alignment with the research objectives and ensuring their academic quality. Out of these 254 articles, 71 were successfully retrieved, while 183 were either inaccessible or could not be found. This outcome notably highlights the importance of database accessibility and availability, which can sometimes pose challenges in systematic reviews. These 71 articles were then evaluated for eligibility to ensure they met the inclusion criteria established for this study. The eligibility phase proved straightforward, as all 71 articles met the necessary criteria and were included in the review without any further exclusions. At this stage, no additional articles were sourced from other databases or repositories, which ensures the consistency and integrity of the review process. these 71 articles became the foundation for the systematic review. After inclusion, the articles underwent thematic analysis, following the PRISMA protocol, to identify recurring themes, patterns, and insights relevant to the research topic. The thematic analysis was carried out using the Watase Uake System (Wahyudi, 2024), a method specifically designed to identify significant trends across the selected studies.

During the screening phase, the remaining 254 articles were carefully evaluated for both relevance and validity. This process involved assessing the articles for their alignment with the research objectives and ensuring their academic quality. Out of these 254 articles, 71 were successfully retrieved, while 183 were either inaccessible or could not be found. This outcome notably highlights the importance of database accessibility and availability, which can sometimes pose challenges in systematic reviews. These 71 articles were then evaluated for eligibility to ensure they met the inclusion criteria established for this study. The eligibility phase proved straightforward, as all 71 articles met the necessary criteria and were included in the review without any further exclusions. At this stage, no additional articles were sourced from other databases or repositories, which ensures the consistency and integrity of the review process. These 71 articles became the foundation for the systematic review.

After inclusion, the articles underwent thematic analysis following the six-phase framework proposed by Braun and Clarke (2006, 2021), facilitated by the Watase Uake

System (Wahyudi, 2024). In the familiarization phase, both researchers read all articles fully to understand their content and identify preliminary patterns. The initial coding phase involved line-by-line coding of findings and discussion sections, generating 247 initial codes such as "digital leadership challenges," "value-based technology adoption," and "teacher resistance to technology." During the theme search phase, similar codes were grouped conceptually, producing 12 candidate themes. In the theme review phase, both researchers independently evaluated these candidates, merging overlapping themes and eliminating those with insufficient support, which reduced the themes to four. Inter-coder reliability testing on a 20% article sample (n=14) showed 87.3% agreement with a Kappa value of 0.82, indicating "almost perfect" reliability. The theme definition phase refined and named the four final themes: (1) Digital Leadership and Institutional Readiness, (2) Value-Based Technology Integration, (3) Curriculum Transformation and Pedagogical Innovation, and (4) 21st-Century Competencies Development. In the final reporting phase, these themes were mapped onto the proposed conceptual framework with illustrative quotations from the original studies.

To ensure transparency and replicability, Table 1 presents the final themes, their definitions, the number of studies contributing to each theme, and illustrative examples of coded text.

Table 2. Thematic Analysis Results

Theme	Definition	Number of Studies	Example Coded Text (Source)
Digital Leadership and Institutional Readiness	The role of leadership in facilitating technology integration, including vision-setting, resource allocation, and teacher support	28 studies	"Successful technology integration during the pandemic was strongly associated with principals' digital leadership competencies" (AlAjmi, 2022, p. 8)
Value-Based Technology Integration	Approaches to adopting digital tools that align with and reinforce Islamic values rather than compromising them	35 studies	"Educators expressed concern that unfettered technology access might weaken students' connection to religious teachings" (Hasanah & Nurdin, 2023, p. 12)
Curriculum Transformation and Pedagogical Innovation	Changes in curriculum design and teaching practices resulting from technology integration	42 studies	"The introduction of digital tools necessitated a fundamental rethinking of how traditional Islamic subjects are taught" (Falaqi et al., 2025, p. 15)
21st-Century Competencies Development	The cultivation of skills such as critical thinking, collaboration, creativity, and digital literacy	35 studies	"Students demonstrated improved collaborative problem-solving skills when using digital

Theme	Definition	Number of Studies	Example Coded Text (Source)
	through technology-enhanced learning		platforms for group projects" (Zulkarnain et al., 2025, p. 22)

Note: Some studies contributed to multiple themes, so the sum of studies across themes exceeds the total number of included studies (71).

Following the rigorous PRISMA process guarantees both the transparency and quality of this systematic review. By adhering to these clearly defined stages—identification, screening, eligibility, and inclusion the study ensures that the selected articles meet the highest academic standards. This approach also ensures the review's methodological rigor and reproducibility. The process is fully documented in the PRISMA flow diagram (Figure 1), which provides an intuitive summary of the selection process and also reflects any challenges encountered, such as difficulties in accessing certain articles. These challenges may offer valuable insights for improving future systematic reviews in this field. Thus, this methodical, transparent, and systematic approach aligns with best practices in academic research, ensuring the review is both rigorous and credible while providing a comprehensive examination of the topic.

III. Result and Discussion

A. Research Findings

The systematic search yielded 71 studies published between 2019 and 2025, revealing a research landscape heavily concentrated in Southeast Asia where 72% of the studies originate, particularly Indonesia with 48 studies and Malaysia with 9 studies, leaving only one study addressing contexts beyond this region. This geographical concentration is accompanied by methodological dominance of qualitative case studies (68%), followed by mixed-methods (22%) and quantitative surveys (10%). These patterns indicate that the discourse on Islamic education and technology is predominantly shaped by Southeast Asian experiences, leaving substantial gaps in understanding how these dynamics operate in Middle Eastern, African, or Western Muslim minority contexts. Beyond descriptive patterns, our thematic analysis reveals three fundamental tensions that cut across the literature. These tensions represent unresolved dialectics that structure the field and shape how technology integration unfolds in Islamic educational contexts.

Across 42 studies, a consistent pattern emerges of Islamic educational institutions, particularly pesantren in Indonesia, attempting to integrate digital technologies while preserving traditional curricular structures. While studies such as those by Falaqi et al. (2025) and Zulkarnain et al. (2025) demonstrate that introducing digital tools enhances student engagement and learning outcomes, reading these findings against studies of

implementation challenges (AlAjmi, 2022; Yusuf & Firdaus, 2021) reveals that technology adoption is not merely a technical process but a pedagogical one that fundamentally disrupts established teaching practices. The literature shows that institutions with strong digital leadership navigate this tension more successfully, yet only 12 studies explicitly examine leadership structures, suggesting that the field has thoroughly documented what happens when technology enters Islamic education but remains thin on how institutional agency shapes integration outcomes.

Studies consistently report that educators worry about technology compromising religious values (Hasanah & Nurdin, 2023) while simultaneously acknowledging its necessity for preparing students for modern life. Synthesizing across 28 studies addressing this tension reveals three distinct institutional responses:

1. Restrictive integration: Limiting technology to administrative functions, keeping it separate from core pedagogical activities.
2. Selective adoption: Using only tools that have been vetted for alignment with Islamic values.
3. Transformative adaptation: Redesigning pedagogy to leverage technology while explicitly teaching value discernment

Notably, transformative adaptation appears in only 7 studies, all from well-resourced urban pesantren, suggesting that institutional capacity significantly conditions how value-technology tensions are resolved. While 35 studies advocate for integrating critical thinking, collaboration, and creativity into Islamic curricula, the evidence for actual implementation is uneven. Jones and Brown (2019) document substantial variation in how these competencies are understood and taught across institutions, revealing that "21st-century competencies" function as a floating signifier meaning digital literacy in some contexts, problem-solving skills in others, and entrepreneurial capacity in still others. This conceptual ambiguity represents a significant barrier to curriculum reform, as institutions lack a shared framework for translating competency discourse into pedagogical practice. Synthesizing across these three tensions, we propose an explicit conceptual framework that addresses the gap between technological integration and value preservation in Islamic education. We term this the Humanistic Pesantren Curriculum Model.

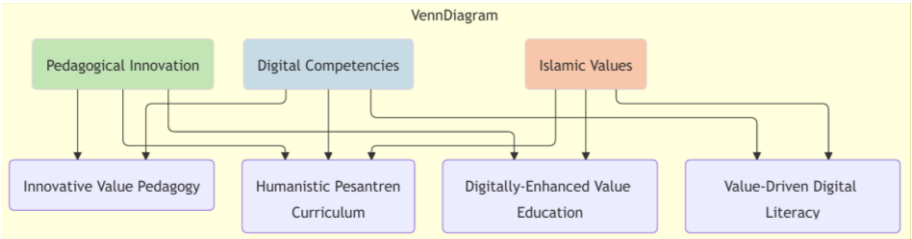

Figure 2. The Humanistic Pesantren Curriculum Model

Tabel 3. The Model Specifies Three Integration Zones

Domain/Zone	Core Components	Integration Challenge	Institutional Response	Desired Outcome
Digital Competencies	Technical skills, Information literacy, Digital ethics	Avoiding techno-determinism while maintaining relevance	Adaptive leadership; Infrastructure investment	Technologically proficient graduates
Islamic Values	Aqidah, Akhlak, Adab, Fiqh	Preserving essence while engaging modernity	Value audit of technologies; Ethical guidelines	Morally grounded graduates
Pedagogical Innovation	Student-centered learning, Critical thinking, Collaboration	Transforming teaching without abandoning tradition	Teacher training; Curriculum redesign	Dynamically skilled graduates
Integration Zones				
Value-Driven Digital Literacy	Digital skills taught through Islamic ethical frameworks	Preventing secularization of digital competence	Integrated curriculum design	Digitally ethical graduates
Digitally-Enhanced Value Education	Technology-mediated value transmission	Maintaining spiritual depth in digital formats	Blended learning design	Engaged value learners
Innovative Value Pedagogy	Traditional values taught through modern methods	Balancing structure with creativity	Pedagogical experimentation	Adaptive value practitioners
Central Integration	Fully realized humanistic curriculum	Simultaneous optimization of all domains	Systemic institutional strategy	Holistically developed graduates

The model specifies three integration zones where these domains overlap:

1. Value-Driven Digital Literacy: Digital skills are taught through Islamic ethical frameworks, ensuring that technological competence develops within moral boundaries
2. Digitally-Enhanced Value Education: Technology mediates value transmission while maintaining spiritual depth, preventing the secularization of religious education
3. Innovative Value Pedagogy: Traditional values are taught through modern methods, balancing structure with creativity and memorization with critical thinking

The central intersection of all three domains represents the fully realized Humanistic Pesantren Curriculum, where institutions have achieved what we term integrative agency the capacity to selectively adopt, adapt, and transform technological tools in ways that strengthen rather than dilute Islamic values.

Applying the Humanistic Pesantren Curriculum Model to reinterpret the existing literature reveals patterns that were invisible in the initial descriptive analysis. First, the geographical concentration of research in Southeast Asia, initially viewed as a limitation, can be more productively understood as a context-specific laboratory where all three domains of the model are actively being negotiated. Indonesian pesantren, in particular, offer rich cases of what we term "integrative agency" the capacity to selectively adopt technology while preserving Islamic identity because they operate within a socio-political environment that simultaneously demands technological modernization and the preservation of Islamic values. Thus, this geographical concentration not only indicates limitations in generalizability but also provides rich contextual data that can serve as a foundation for further theoretical development.

Upon closer examination, the three main tensions identified in our synthesis correspond directly to the three domains within the proposed model. The first tension, curriculum stability versus digital disruption, operates primarily within the Pedagogical Innovation domain, where Islamic educational institutions grapple with transforming their teaching practices. The second tension, value preservation versus pedagogical transformation, spans the Islamic Values and Digital Competencies domains, manifesting as the challenge of maintaining ethical grounding while developing technical skills. Meanwhile, the third tension, 21st-century competencies versus traditional learning paradigms, reflects incomplete integration across all three domains, indicating the absence of a coherent framework for simultaneously connecting competency discourse to value education and pedagogical practice.

Furthermore, re-reading the existing studies through our framework exposes a critical gap that has been overlooked. The literature extensively documents the presence of technology in Islamic education but rarely examines the quality of its integration. Of the 48 Indonesian studies analyzed, the majority report that technology is being adopted, yet only 12 provide evidence of how this adoption relates to the achievement of Islamic values. This finding suggests that the field has prioritized documenting innovation over evaluating its consequences a significant methodological limitation that future research must urgently address.

Equally important, the variation in institutional responses identified in our synthesis restrictive integration, selective adoption, and transformative adaptation corresponds to different positions within the model's three domains. Institutions that achieve transformative adaptation occupy the central integration zone, having successfully aligned digital competencies, Islamic values, and pedagogical innovation simultaneously.

However, the existing literature remains very limited in providing guidance on how institutions can move from peripheral to central positions. This gap indicates a pressing need for longitudinal and process-oriented research that can elucidate the dynamics and mechanisms of transition toward more perfect integration. Thus, the model we offer not only serves as a diagnostic tool but also as a roadmap guiding future research agendas in this field.

B. Discussion

The findings from this review provide a comprehensive and critical overview of the intersection between digital technology and Islamic education, particularly in pesantren. What stands out from the analysis is the clear potential of technology to enhance the learning environment and develop key competencies needed for the 21st century. However, this review goes beyond simply acknowledging the promise of technology in education; it also addresses the complex challenge of balancing technological innovation with the preservation of the core values of Islamic education. In this regard, the findings offer a novel perspective, highlighting the critical need for a curriculum that not only fosters digital literacy but also respects and reinforces Islamic educational principles.

Interestingly, the results are in line with prior research, particularly studies that emphasize the growing integration of technology in Islamic education in Southeast Asia. For instance, similar findings have been observed in studies by Li (2024) and Zhang et al. (2023), which underscore the widespread adoption of digital tools in educational settings, especially in countries like Indonesia and Malaysia. These studies, much like the findings of this review, reflect an increasing recognition of the importance of developing digital competencies among students. However, unlike these earlier studies, this review presents a more integrative approach, one that emphasizes the need to harmonize technological tools with humanistic values something that has often been overlooked in previous literature.

What is particularly interesting about this review is that it not only identifies the positive impact of technology on student engagement and learning outcomes but also critically examines the long-term consequences of such integration on students' religious identity and moral development. Prior studies have largely focused on the immediate effects of technology on academic performance or student engagement (e.g., Mourlam et al., 2020; AlAjmi, 2022), but they have rarely explored how these tools affect students' spiritual and moral growth over time. This review, therefore, adds a much-needed layer of depth to the existing body of research, suggesting that future investigations should consider the long-term implications of digital technology in Islamic educational contexts, especially in how it might influence students' connection to their faith.

IV. Conclusion

This systematic review set out to examine the integration of digital technologies into Islamic education, with particular focus on developing a humanistic pesantren curriculum that enhances 21st-century competencies while preserving Islamic values. In contrast to previous reviews that have largely provided descriptive accounts of technology adoption, this study offers three distinct theoretical contributions that advance the field beyond its current trajectory.

First, this review contributes a novel conceptual framework the Humanistic Pesantren Curriculum Model which explicitly maps the integration of three interdependent domains: Digital Competencies, Islamic Values, and Pedagogical Innovation. Which explain technology adoption in general terms, this model is specifically tailored to Islamic educational contexts. It specifies three integration zones (Value-Driven Digital Literacy, Digitally-Enhanced Value Education, and Innovative Value Pedagogy) that operationalize how institutions can achieve what we term "integrative agency" the capacity to selectively adopt and adapt technology in ways that strengthen rather than dilute religious values. This framework provides scholars with a diagnostic tool for analyzing technology integration beyond mere presence-or-absence questions, enabling nuanced assessments of integration quality.

Second, this review identifies and synthesizes three fundamental tensions that structure the field curriculum stability versus digital disruption, value preservation versus pedagogical transformation, and 21st-century competencies versus traditional learning paradigms thereby moving the discourse from descriptive documentation toward theoretical problematization. Previous systematic reviews have catalogued what technologies are being used and where; this review explains why integration efforts succeed or fail by revealing the underlying dialectics that institutions must navigate. For researchers, these tensions offer a generative framework for formulating research questions that address root causes rather than surface phenomena.

Third, this review systematically exposes critical gaps that future research must address: the geographical concentration in Southeast Asia that limits generalizability, the methodological dominance of qualitative case studies that leaves relationships between domains empirically untested, and the absence of longitudinal research tracking technology's long-term impact on students' spiritual and ethical development. By mapping these gaps onto our proposed framework, we provide future scholars with a clear research agenda that specifies not only what is missing but also how to investigate it using appropriate theoretical and methodological tools.

What distinguishes this review from previous SLRs is its movement beyond description toward prescription. While earlier reviews have asked "what does the literature say about technology in Islamic education?", this review asks "what conceptual tools do scholars need to advance this field?" The answer an explicit framework,

identified tensions, and mapped gaps provides researchers with actionable resources for designing studies that build cumulatively rather than repetitively. For practitioners and policymakers, the framework offers practical guidance for assessing institutional positioning and prioritizing interventions across the three domains.

In conclusion, this review argues that the challenge facing Islamic education in the digital age is not technological but conceptual. Institutions do not need more technology; they need better frameworks for understanding how technology relates to their fundamental purposes. The Humanistic Pesantren Curriculum Model, the identification of structuring tensions, and the mapped research agenda together constitute the conceptual infrastructure required for the field to mature from documenting innovation to evaluating its consequences, from describing adoption to explaining integration quality, and from normative advocacy to theoretically-grounded guidance. By making these contributions explicit, we invite critique, refinement, and empirical testing the essential processes through which academic knowledge advances and, ultimately, through which Islamic education can harness technology's potential without compromising its spiritual and ethical foundations. balances.

Bibliography

Abina, A., Temeljotov Salaj, A., Cestnik, B., Karalič, A., Ogrinc, M., Kovačič Lukman, R., & Zidanšek, A. (2024). Challenging 21st-century competencies for STEM students: Companies' vision in Slovenia and Norway in the light of global initiatives for competencies development. Sustainability, 16(3), 1295. https://doi.org/10.3390/su16031295

Alelaimat, A. M., Ihmeideh, F. M., & Alkhawaldeh, M. F. (2021). Preparing preservice teachers for technology and digital media integration: Implications for early childhood teacher education programs. International Journal of Early Childhood, 53(1), 27–44. https://doi.org/10.1007/s13158-020-00276-2

Alanazi, F. H., & Alghamdi, A. K. H. (2023). Between biology and religion: Dialogue in the Saudi primary science classroom. Journal of Biological Education. https://doi.org/10.1080/00219266.2023.2192724

AlAjmi, M. K. (2022). The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait. International Journal of Educational Research, 115, 101928. https://doi.org/10.1016/j.ijer.2022.101928

Anomah, S., Ayeboafo, B., Aduamoah, M., & Agyabeng, O. (2024). Blockchain technology integration in tax policy: Navigating challenges and unlocking opportunities for improving the taxation of Ghana's digital economy. Scientific African, 19, e02210. https://doi.org/10.1016/j.sciaf.2024.e02210

Ashraf, M. A., Tsegay, S. M., & Ning, J. (2021). Teaching global citizenship in a Muslim-majority country: Perspectives of teachers from the religious, national, and international education sectors in Pakistan. Religions, 12(5), 348. https://doi.org/10.3390/rel12050348

Bakti, I. K., Kurniawan, R., Mukhlishah, M., Mudlofir, A., Kusaeri, K., & Bahri, R. (2025). Integrating Islamic values in inclusive madrasa education: A unique approach for special needs students. International Journal of Inclusive Education. https://doi.org/10.1080/13603116.2025.2555397

Bashith, A., Mkumbachi, R. L., Yunus, M., Amin, S., Sulistiani, D., & Amrullah, A. M. K. (2025). Nexus of economic teaching in religious education: A case study of Islamic boarding schools in Indonesia. Cogent Education. https://doi.org/10.1080/2331186X.2025.2486633

Bin Jamil, A. I. (2022). Country report: Religious education in Malaysia. British Journal of Religious Education. https://doi.org/10.1080/01416200.2022.2029170

Butcher, K. R. (2024). Promoting understanding in digital contexts: Using the construction-integration model as a framework for educational technology design and assessment. Discourse Processes, 61(4), 329–345. https://doi.org/10.1080/0163853X.2024.2357983

Cascone, S. (2023). Digital technologies and sustainability assessment: A critical review on the integration methods between BIM and LEED. Sustainability, 15(6), 5548. https://doi.org/10.3390/su15065548

Chen, Y., & Gao, H. (2025). Exploring the impact of digital literacy on art education teachers' ICT integration intention based on the extended technology acceptance model. SAGE Open. https://doi.org/10.1177/21582440251378790

Cheng, Q., Peng, C., Fu, Y., Dai, Y., Wan, H., Zhang, S., & Wu, S. (2025). The integration of digital technology and knowledge management: Influence factors of enterprise knowledge digitisation. Knowledge Management Research & Practice. https://doi.org/10.1080/14778238.2025.2522140

Costes-Onishi, P., Shaik Kadir, M., & Vignesh, V. (2025). Advancing classroom pedagogies for 21st-century competencies: Insights from artist educators teaching and artistic sensibilities. Arts Education Policy Review. https://doi.org/10.1080/10632913.2025.2562387

Desmaryani, S., Soleh, A., Irmanelly, I., & Wiarta, I. (2024). Integration of technology acceptance models and government support to improve digital literacy. Heliyon, 10(8), e34086. https://doi.org/10.1016/j.heliyon.2024.e34086

Dockendorff, M., & Zaccarelli, F. G. (2024). Successfully preparing future mathematics teachers for digital technology integration: A literature review. International Journal of Mathematical Education in Science and Technology. https://doi.org/10.1080/0020739X.2024.2309273

Falaqi, M. R., Ritonga, A. W., Mufid, M., Hamid, M. A., Maulidi, M., Hidayat, S., Suladi, S., Sarwanih, S., & Handoyo, F. (2025). Transformation of Islamic education curriculum based on the thoughts of three educational philosophers: A systematic literature review. British Journal of Religious Education. https://doi.org/10.1080/01416200.2025.2521384

Fathur Rohman. (2022). Problem-based learning in Islamic religious education: The case of the Indonesian pesantren. Global Journal Al-Thaqafah, 12(2), 35–48. https://doi.org/10.7187/GJAT072022-5

Felsenthal, I., & Agbaria, A. (2025). Justice before God: Critical Islamic education based on the work of Tariq Ramadan. British Journal of Religious Education. https://doi.org/10.1080/01416200.2025.2480655

Ghosh, D., & Dash, S. (2023). Barriers and facilitators of B2B degree of digital use and brand engagement: An integration of technology and behavioral perspectives. Journal of Business & Industrial Marketing, 38(11), 2167–2182. https://doi.org/10.1108/JBIM-09-2022-0406

Ghosn, F., Zreik, M., Al Dilby, H. K., Kassably Fakhry, C. D., & Hassanein, F. R. (2025). Tokenomics and digital economy in China: Analyzing the influence of blockchain technology integration on traditional business models. Economies, 13(7), 189. https://doi.org/10.3390/economies13070189

Ionescu, A. M., Clipa, A. M., Turnea, E. S., Clipa, C. I., Bedrule-Grigoruță, M. V., & Roth, S. (2022). The impact of innovation framework conditions on corporate digital technology integration: Institutions as facilitators for sustainable digital transformation. Journal of Business Economics and Management, 23(7), 1437–1455. https://doi.org/10.3846/jbem.2022.17039

Ju, Y., Hou, H., & Yang, J. (2020). Integration quality, value co-creation, and resilience in logistics service supply chains: Moderating role of digital technology. Industrial Management & Data Systems, 121(7), 1543–1562. https://doi.org/10.1108/IMDS-08-2020-0445

Jyeniskhan, N., Shomenov, K., Ali, M. H., & Shehab, E. (2024). Exploring the integration of digital twin and additive manufacturing technologies. International Journal of Lightweight Materials and Manufacture, 7(4), 311–325. https://doi.org/10.1016/j.ijlmm.2024.06.004

Karakose, T., Demirkol, M., Yirci, R., Polat, H., Ozdemir, T. Y., & Tülübaş, T. (2023). A conversation with ChatGPT about digital leadership and technology integration: Comparative analysis based on human–AI collaboration. Administrative Sciences, 13(7), 157. https://doi.org/10.3390/admsci13070157

Li, M. (2024). Exploring the digital divide in primary education: A comparative study of urban and rural mathematics teachers' TPACK and attitudes towards technology integration in post-pandemic China. Education and Information Technologies. https://doi.org/10.1007/s10639-024-12890-x

Liu, Y., & Li, J. (2024). Measures for the integration of digital media art and film and animation creation based on virtual reality technology. Applied Mathematics and Nonlinear Sciences. https://doi.org/10.2478/amns.2023.2.01565.

Luo, W., Berson, I. R., & Berson, M. J. (2020). Integration of digital technology into an early childhood teacher preparation program in China. Early Childhood Education Journal, 48(6), 703–714. https://doi.org/10.1007/s10643-020-01115-8

Mahsusi, M., Hudaa, S., Fahmi, M., Kusen, K., Haryanti, N. D., & Wajdi, M. B. N. (2024). Achieving excellence: The role of digital transformation in madrasah management and Islamic culture. Cogent Arts & Humanities. https://doi.org/10.1080/23311983.2024.2304407

McCartney, S., Murphy, C., & McCarthy, J. (2020). 21st century HR: A competency model for the emerging role of HR analysts. Personnel Review, 49(7), 1487–1504. https://doi.org/10.1108/PR-12-2019-0670

Md. Sapir @ Md. Shafik, A. S., & Wan Ahmad, W. M. (2020). Financial literacy among Malaysian Muslim undergraduates. Journal of Islamic Accounting and Business Research, 11(2), 207–221. https://doi.org/10.1108/JIABR-10-2017-0149

Mourlam, D. J., DeCino, D. A., Newland, L. A., & Strouse, G. A. (2020). It's fun!: Using students' voices to understand the impact of school digital technology integration on their well-being. Computers & Education, 159, 104003. https://doi.org/10.1016/j.compedu.2020.104003

Mukhibat, M., Effendi, M., Setyawan, W. H., & Sutoyo, M. (2024). Development and evaluation of religious moderation education curriculum at higher education in Indonesia. Cogent Education, 11(1), 2302308. https://doi.org/10.1080/2331186X.2024.2302308

Nadeem, A., Cheema, M. K., & Zameer, S. (2020). Perceptions of Muslim parents and teachers towards sex education in Pakistan. Sex Education, 20(5), 489–505. https://doi.org/10.1080/14681811.2020.1753032

Nasir, N. (2022). Need for character development program based on Islamic doctrines as a counter-terrorism approach at HEIs of Pakistan. Religion & Education, 49(3), 311–326. https://doi.org/10.1080/15507394.2022.2139995

Niu, S. J., Niemi, H., Harju, V., & Pehkonen, L. (2021). Finnish student teachers' perceptions of their development of 21st-century competencies. Journal of Education for Teaching, 47(4), 483–501. https://doi.org/10.1080/02607476.2021.1951602

Olaye, I. M., & Seixas, A. A. (2023). The gap between AI and bedside: Participatory workshop on the barriers to the integration, translation, and adoption of digital health care and AI startup technology into clinical practice. Journal of Medical Internet Research, 25(3), 32962. https://doi.org/10.2196/32962

Ozgen, Z., & El Shishtawy Hassan, S. I. (2021). Meaning of a textbook: Religious education, national Islam, and the politics of reform in the United Arab Emirates. Nations and Nationalism, 27(4), 1002–1020. https://doi.org/10.1111/nana.12734

Parker, W., Sturgeon, C., & Szempruch, J. N. (2025). Navigating the digital landscape: A survey of technology integration among academic business librarians. Journal of Business & Finance Librarianship. https://doi.org/10.1080/08963568.2025.2493482

Pazilah, F. N., Hashim, H., & Yunus, M. M. (2024). Refining the TPACK framework: A fuzzy Delphi approach to 21st-century competency and self-efficacy constructs. Cogent Education. https://doi.org/10.1080/2331186X.2024.2428886

Pérez Zúñiga, R., Martínez García, M., Campos-Valdez, M., & Sánchez-Orozco, L. V. (2025). Pedagogical and evaluative competencies for the 21st century in molecular biology education and their relationship with honors programs: A systematic literature review. Frontiers in Education, 10, 1616858. https://doi.org/10.3389/feduc.2025.1616858

Pianda, D., Hilmiana, H., Widianto, S., & Sartika, D. (2025). The influence of employability of vocational students through internship experiences and 21st-century competencies: A moderated mediation model. Cogent Education. https://doi.org/10.1080/2331186X.2025.2476285

Pollard, D., Harrison, C., Dodgson, S., Holland, M., & Khair, K. (2020). The UK haemophilia specialist nurse: Competencies fit for practice in the 21st century. Haemophilia, 26(5), 927–934. https://doi.org/10.1111/hae.14002

Pratiwi, H., Sujarwo, S., Syamsudin, A., & Riwanda, A. (2024). Equipping prospective teachers for culturally and religiously sensitive sexuality education: Curriculum reviews at Islamic universities in Indonesia. Journal of Early Childhood Teacher Education. https://doi.org/10.1080/10901027.2024.2421189

Pusparini, M. D., Bonang, D., Virgiawan, R., Sukmana, R., Lahuri, S. B., & Fedro, A. (2024). Does religiosity affect green entrepreneurial intention? Case study in Indonesia. Journal of Islamic Marketing. https://doi.org/10.1108/JIMA-12-2023-0419

Qazi, M. H. (2021). Construction of students' religious national identities in Pakistani state schools and its implications for minorities. Compare: A Journal of Comparative and International Education, 51(6), 912–930. https://doi.org/10.1080/03057925.2021.1886053

Rahimi, A. R., & Daneshvar Ghorbani, B. (2025). Developing and validating the scale of language teachers' computational thinking competency in computer-assisted language learning (LTCCTCALL): Empowering language teaching by cultivating the heart of the 21st-century digital skill. Asian-Pacific Journal of Second and Foreign Language Education. https://doi.org/10.1186/s40862-025-00353-w

Saghiri, S., & Mirzabeiki, V. (2021). Omni-channel integration: The matter of information and digital technology. International Journal of Operations & Production Management, 41(8), 1042–1066. https://doi.org/10.1108/IJOPM-04-2021-0262

Sadri, H., Yitmen, I., Tagliabue, L. C., Westphal, F., Tezel, A., Taheri, A., & Sibenik, G. (2023). Integration of blockchain and digital twins in the smart built environment: Adopting disruptive technologies—A systematic review. Sustainability, 15(4), 3713. https://doi.org/10.3390/su15043713

Sen, A. (2020). Articulations of Islamic nationalism in the educational reform discourse of new Turkey. Discourse: Studies in the Cultural Politics of Education, 41(6), 938–951. https://doi.org/10.1080/01596306.2020.1817859

Shaikh, A. L., & Alam Kazmi, S. H. (2021). Exploring marketing orientation in integrated Islamic schools. Journal of Islamic Marketing, 12(7), 1354–1369. https://doi.org/10.1108/JIMA-11-2019-0241

Sijamhodžić-Nadarević, D. (2023). Contribution of Islamic religious education to intercultural values in pluralistic European cultures: Insights from Bosnia and Herzegovina. Religions, 14(4), 453. https://doi.org/10.3390/rel14040453

Statti, A., & Torres, K. M. (2020). Digital literacy: The need for technology integration and its impact on learning and engagement in community school environments. Peabody Journal of Education, 95(2), 234–245. https://doi.org/10.1080/0161956X.2019.1702426

Subaidi, S., Tantowi, A., Cholid, N., Junaedi, M., Waluyo, W., & Nursikin, M. (2023). Eco-pesantren: Islamic education in forest conservation landscapes. Fudan Journal of the Humanities and Social Sciences, 17(2), 211–231. https://doi.org/10.1007/s40647-023-00386-w

Wang, L. (2024). Integration and innovative application of new media technology in literary creation in the digital age. Applied Mathematics and Nonlinear Sciences. https://doi.org/10.2478/amns-2024-2866

Wei, B., Lin, J., Chen, S., & Chen, Y. (2020). Integrating 21st-century competencies into a K–12 curriculum reform in Macau. Asia Pacific Journal of Education, 41(4), 505–523. https://doi.org/10.1080/02188791.2020.1824893

Weisberg, L., & Dawson, K. (2024). Picturing digital equity in the curriculum: Cultivating preservice teachers' digital equity mindsets in a technology integration course. Computers & Education, 210, 104988. https://doi.org/10.1016/j.compedu.2024.104988

Yadav, S., Samadhiya, A., Kumar, A., Luthra, S., Kumar, V., Garza-Reyes, J. A., & Upadhyay, A. (2024). The interplay effects of digital technologies, green integration, and green innovation on food supply chain sustainable performance: An organizational information processing theory perspective. Technology in Society, 79, 102585. https://doi.org/10.1016/j.techsoc.2024.102585

Yuan, Z., Hooy, C. W., Sun, Y., & Liu, B. (2025). Digital technology transformation and corporate ESG performance: Evidence from the integration of informatization and industrialization pilot zone. Applied Economics. https://doi.org/10.1080/00036846.2025.2547118

Zaragoza, M. C., Díaz-Gibson, J., Caparrós, A. F., & Solé, S. L. (2019). The teacher of the 21st century: Professional competencies in Catalonia today. Educational Studies, 55(5), 491–507. https://doi.org/10.1080/03055698.2019.1686697

Zhang, Y., & Ding, N. (2024). A study on the integration of virtual reality and augmented reality technologies in digital media education. Applied Mathematics and Nonlinear Sciences. https://doi.org/10.2478/amns-2024-3181

Zhang, Y., Mu, G. M., & Hu, Y. (2023). Gauging 21st-century competencies of Chinese students: A rural–urban comparative perspective. Journal of Research on Educational Effectiveness, 16(2), 221–240. https://doi.org/10.1080/19345747.2023.2181245

Zhou, T., Zhang, S., Liu, S., & Yu, J. (2025). Digital technology integration in home-based exercise: A systematic review of research evolution, applications, and impact mechanisms. BMC Public Health. https://doi.org/10.1186/s12889-025-24679-9

Zou, H., Liu, B., Guo, Y., Qin, H., & Li, Y. (2025). Digital technologies integration strategies in innovation ecosystems based on differential games. Technology Analysis & Strategic Management. https://doi.org/10.1080/09537325.2025.2522852

Zulkarnain, Z., Bulan, S., Bakti, I. K., Ismail, S. N., Huda, M. N., & Kusaeri, K. (2025). Religious moderation in Islamic education as an approach to preventing sexual harassment: Implementation analysis in Indonesian madrasahs. British Journal of Religious Education. https://doi.org/10.1080/01416200.2025.2570481