

The Transformation of the Epistemology of Islamic Education in Islamic Boarding Schools: The Dialectic of Heritage, Digital Literacy, and the Challenges of Globalization

Budiyanto¹, Shahzadi Hina², Ahmad Tanzeh³, Agus Purwowododo⁴

¹ STAI Wali Songo Situbondo, Indonesia

² Beaconhouse National University, Pakistan

^{3,4} UIN Sayyid Ali Rahmatullah Tulungagung, Indonesia

E-mail: budiyanto3781@gmail.com; shahzadi.hina88@gmail.com ; tanzehahmad@gmail.com
Widodopurwo74@gmail.com

Abstract: This study examines the epistemological transformation of Islamic education in pesantren amid the rapid development of digital technology and the increasing pressures of globalization. The research aims to analyze how pesantren negotiate the dialectical relationship between *turats* (classical Islamic intellectual heritage), digital literacy, and contemporary global challenges while maintaining their educational identity and religious values. This study employs a qualitative library research approach by reviewing scholarly literature, policy documents, and recent studies related to Islamic education, digital transformation, and pesantren development. The findings reveal that the epistemological transformation of pesantren is characterized by the integration of traditional Islamic knowledge with digital competencies, resulting in a dynamic educational framework that combines preservation and innovation. The study identifies three major transformation patterns: the reinterpretation of *turats* through contextual approaches, the incorporation of digital literacy into learning systems, and the adaptation of educational practices to respond to global knowledge society demands. Despite concerns regarding cultural homogenization, information overload, and ethical challenges in digital environments, pesantren demonstrate considerable adaptability in developing a balanced model of Islamic education. The study concludes that the future sustainability of pesantren depends on their ability to harmonize classical Islamic epistemology with technological advancement and global engagement. The implications of this research highlight the importance of developing transformative educational policies and curricula that strengthen Islamic intellectual traditions while fostering critical, digital, and global competencies among learners.

Keywords: *Islamic Education, Pesantren, Epistemological Transformation, Turats, Digital Literacy, Globalization.*

INTRODUCTION

The acceleration of digital technology development and the emergence of a global knowledge society have significantly transformed educational paradigms across the world. Educational institutions are no longer merely expected to transmit knowledge but are also required to develop adaptive competencies, digital literacy, critical thinking, and global awareness among learners. These transformations have affected not only secular educational institutions but also religious educational systems, including Islamic boarding schools (*pesantren*), which have historically served as centers for the transmission of Islamic knowledge, moral values, and social transformation within Muslim communities. The rapid advancement of artificial intelligence, digital communication platforms, online learning ecosystems, and global information networks has created both opportunities and challenges for *pesantren* in preserving their traditional epistemological foundations while responding to contemporary educational demands (Nata, 2024).

Pesantren occupies a distinctive position within the Indonesian educational landscape. For centuries, *pesantren* have functioned as institutions that preserve and transmit *turats*, namely the classical Islamic intellectual heritage embodied in the study of the Qur'an, Hadith, jurisprudence (*fiqh*), theology (*kalam*), Sufism (*tasawuf*), and other branches of Islamic sciences. The epistemological structure of *pesantren* has traditionally emphasized textual authority, teacher-centered learning, spiritual discipline, and the continuity of scholarly transmission through *sanad* (chain of knowledge). This educational tradition has contributed significantly to the development of Islamic civilization in Indonesia and has enabled *pesantren* to maintain their legitimacy as authentic institutions of Islamic learning (Zarkasyi, 2019).

However, the contemporary era presents unprecedented challenges that require *pesantren* to reconsider their epistemological orientation. The rise of digital technology has transformed the way knowledge is produced, disseminated, accessed, and validated. Learners are no longer dependent solely on teachers and printed texts as sources of knowledge. Instead, they can access vast amounts of information through digital platforms, online databases, social media, and artificial intelligence applications. Consequently, traditional educational authorities are increasingly confronted with new forms of knowledge production that transcend geographical, institutional, and cultural boundaries (Azra, 2020). In this context, *pesantren* must navigate a complex dialectical relationship between preserving classical Islamic scholarship and embracing digital innovations that characterize contemporary educational environments.

The phenomenon of globalization further intensifies these challenges. Globalization has facilitated the movement of ideas, values, cultures, and technologies across national borders, creating a more interconnected world. While globalization offers opportunities for intercultural dialogue, educational collaboration, and access to knowledge resources, it also raises concerns regarding cultural homogenization, ideological contestation, and the erosion of local religious traditions (Dhofier, 2020). For *pesantren*, globalization necessitates the development of educational strategies that enable students to engage with global realities without losing their Islamic identity and cultural roots. The challenge lies in balancing openness to global knowledge with the preservation of local wisdom and religious authenticity.

The growing importance of digital literacy further underscores the need for epistemological transformation within Islamic education. Digital literacy extends beyond technical proficiency in using digital tools; it encompasses the ability to critically evaluate information, understand digital ethics, navigate online environments responsibly, and utilize technology for meaningful learning and social engagement (Huda, 2021). Within the context of *pesantren*, digital literacy must be integrated with Islamic ethical principles to ensure that technological engagement contributes positively to students' intellectual and moral development. Therefore, the integration of digital literacy into *pesantren* education represents not merely a technological adaptation but also an epistemological reconfiguration of how knowledge is understood, acquired, and applied.

Several previous studies have examined the relationship between Islamic education and digital transformation. Research by Zarkani et al. (2024) found that artificial intelligence has the potential to enhance learning effectiveness, personalize educational experiences, and improve educational management within Islamic institutions. Similarly, Hasan et al. (2023) demonstrated

that digital transformation in pesantren contributes to broader educational accessibility and innovation while maintaining Islamic values. Another study conducted by Izfanna et al. (2024) highlighted the opportunities and challenges associated with integrating artificial intelligence into Islamic education, emphasizing the importance of ethical considerations and human-centered educational approaches (Zarkani, 2019).

Studies focusing on pesantren transformation have also attracted considerable scholarly attention. Fathurrohman (2023) argued that pesantren have increasingly adopted digital technologies in response to societal changes and educational modernization. Likewise, Arifin and Syamsuddin (2022) emphasized the growing significance of digital literacy within pesantren curricula as a means of preparing students for participation in contemporary society (Izfanna, 2023). Furthermore, Rahman and Ismail (2023) examined the broader reform of Islamic education in Southeast Asia, revealing how Islamic institutions adapt to digital civilization while preserving religious traditions.

Despite the growing body of literature, existing studies predominantly focus on technological adaptation, digital learning implementation, educational management, or curriculum innovation. Relatively limited attention has been devoted to examining the deeper epistemological implications of these transformations within pesantren educational thought (Hasan, 2023). Most studies tend to analyze digitalization from practical or managerial perspectives rather than exploring how digital literacy and globalization reshape the underlying structures of knowledge, authority, learning, and truth within pesantren traditions. Consequently, there remains a significant gap in understanding how pesantren negotiate the dialectical relationship between *turats*, digital literacy, and globalization at the epistemological level.

This research seeks to address this gap by investigating the epistemological transformation of Islamic education in pesantren through the lens of dialectical interaction among classical Islamic intellectual heritage, digital literacy, and global challenges (Calista, 2022). Unlike previous studies that primarily focus on technological implementation, this study examines how pesantren reconstruct educational thought, redefine knowledge authority, and reinterpret traditional epistemological frameworks in response to contemporary realities. Such an approach is essential because educational transformation is not merely a matter of adopting new technologies but also involves changes in the philosophical assumptions that underpin educational practices and knowledge production.

The originality of this study lies in its integration of three critical dimensions that are often examined separately in existing scholarship: *turats*, digital literacy, and globalization (Rifa'i, 2021). By analyzing the dynamic interaction among these dimensions, this study offers a comprehensive framework for understanding the ongoing transformation of Islamic educational thought within pesantren. Furthermore, the study contributes to the development of a conceptual model of epistemological transformation that demonstrates how traditional Islamic knowledge systems can coexist with digital innovation and global engagement without compromising their foundational values.

From a theoretical perspective, this study contributes to the discourse on Islamic educational philosophy by extending existing discussions on educational modernization beyond technological considerations toward questions of knowledge construction, authority, and intellectual continuity. It also enriches debates concerning the future of Islamic education in the era of artificial intelligence, digital civilization, and global knowledge societies. From a practical perspective, the findings may provide insights for policymakers, educational leaders, curriculum developers, and pesantren administrators in designing educational strategies that integrate digital competencies while preserving Islamic intellectual traditions.

Therefore, this study aims to analyze how pesantren negotiate the dialectical relationship between *turats*, digital literacy, and contemporary global challenges while maintaining their educational identity and religious values. Specifically, the study seeks to explore the forms of epistemological transformation occurring within pesantren, identify the factors driving these transformations, and examine their implications for the future development of Islamic education. Through this analysis, the research aspires to contribute to a deeper understanding of how pesantren can remain relevant, adaptive, and intellectually vibrant in an increasingly

interconnected and technology-driven world while continuing to serve as custodians of Islamic knowledge and moral formation.

METHOD

This study employed a qualitative research design using a library research approach to investigate the epistemological transformation of Islamic education in pesantren amid the dynamics of digital literacy and globalization. Library research was selected because the study focuses on conceptual, theoretical, and epistemological developments reflected in scholarly publications, policy documents, and contemporary academic discourses rather than direct field observations. The research aimed to analyze how pesantren negotiate the relationship between *turats* (classical Islamic intellectual heritage), digital literacy, and global challenges in shaping contemporary Islamic educational thought.

The researcher served as the primary instrument in collecting, interpreting, and analyzing data. In qualitative library research, the presence of the researcher is essential for identifying relevant sources, categorizing information, and constructing interpretive frameworks. The study did not involve a specific geographical research location because the data were obtained from published documents and digital academic databases. However, the analytical focus was directed toward the Indonesian pesantren context as represented in national and international scholarly literature.

The data sources consisted of primary and secondary materials. Primary sources included peer-reviewed journal articles, books, conference proceedings, and policy documents discussing Islamic education, pesantren studies, digital transformation, artificial intelligence, digital literacy, globalization, and educational epistemology. Secondary sources included research reports, academic reviews, institutional publications, and supporting literature relevant to the study theme. To ensure credibility and relevance, the selected literature was published primarily between 2015 and 2025 and indexed in reputable academic databases.

Data collection was conducted through systematic literature searching, document selection, document classification, and content extraction. The researcher identified relevant publications using keywords such as “Islamic education,” “pesantren,” “turats,” “digital literacy,” “artificial intelligence,” “globalization,” “educational transformation,” and “knowledge society.” The collected documents were then screened according to relevance, scientific quality, and alignment with the research objectives.

The data were analyzed using qualitative content analysis combined with thematic analysis. The analysis process consisted of four stages: data reduction, data categorization, thematic interpretation, and conclusion drawing. During data reduction, irrelevant information was excluded while significant findings were retained. Subsequently, the data were categorized into major themes, including the preservation of *turats*, the integration of digital literacy, epistemological adaptation, and responses to globalization. Thematic interpretation was then conducted to identify patterns, relationships, and transformations occurring within pesantren educational thought. Finally, conclusions were formulated by synthesizing the findings into a comprehensive conceptual framework.

To enhance the trustworthiness of the study, source triangulation was employed by comparing information from different scholarly sources, policy documents, and academic perspectives. Furthermore, analytical consistency was maintained through repeated reading, cross-checking of interpretations, and verification of emerging themes across multiple references.

Table 1. Research Design Framework

RESEARCH COMPONENT	DESCRIPTION
RESEARCH APPROACH	Qualitative Library Research
RESEARCH FOCUS	Epistemological Transformation of Islamic Education in Pesantren
UNIT OF ANALYSIS	Scholarly literature, policy documents, and academic publications
PRIMARY DATA SOURCES	Journal articles, books, conference proceedings, policy documents
SECONDARY DATA SOURCES	Research reports, reviews, institutional publications
DATA COLLECTION TECHNIQUES	Literature search, document review, content extraction, classification
DATA ANALYSIS TECHNIQUES	Qualitative Content Analysis and Thematic Analysis
VALIDATION TECHNIQUE	Source Triangulation and Cross-Reference Verification
EXPECTED OUTPUT	Conceptual model of epistemological transformation in pesantren

Table 1 illustrates the overall research framework employed in this study. The qualitative library research approach enabled the researcher to comprehensively examine the evolution of Islamic educational thought within pesantren through diverse academic sources. The use of content analysis and thematic analysis facilitated the identification of recurring themes and epistemological shifts related to *turats*, digital literacy, and globalization. Through triangulation and cross-reference verification, the study ensured the credibility and reliability of the findings, ultimately producing a conceptual understanding of how pesantren adapt to contemporary educational challenges while preserving their Islamic intellectual traditions.

RESULT AND DISCUSSIONS

Reinterpretation of *Turats* and the Reconstruction of Islamic Educational Epistemology in Pesantren

The findings of this study indicate that the epistemological transformation of Islamic education in pesantren is not characterized by the abandonment of classical Islamic traditions but rather by their reinterpretation within contemporary contexts. The literature reviewed consistently demonstrates that pesantren continue to regard *turats* as the primary source of intellectual authority and religious legitimacy. However, the methods through which classical texts are understood, taught, and contextualized have undergone significant changes in response to social transformation, technological advancement, and global intellectual developments(Fathurrohman, 2021). This finding suggests that pesantren have adopted an adaptive epistemological orientation that allows traditional knowledge systems to remain relevant while addressing contemporary challenges.

Historically, the epistemological foundation of pesantren has been rooted in the transmission of authoritative religious knowledge through the study of classical Islamic texts (*kitab kuning*). Knowledge acquisition was traditionally centered on the authority of the *kyai*, who functioned as the principal source of interpretation and validation(Arifin & Syamsuddin, 2023). The learning process emphasized memorization, textual mastery, spiritual discipline, and continuity of scholarly transmission through *sanad*. Such a model enabled pesantren to preserve Islamic intellectual traditions across generations and contributed significantly to the formation of religious scholars and community leaders. However, the emergence of digital technologies and the proliferation of information sources have challenged the exclusivity of traditional knowledge authority.

The analysis reveals that contemporary pesantren increasingly employ contextual approaches in interpreting *turats*. Rather than understanding classical texts solely through literal readings, many Islamic educational institutions encourage contextual interpretation that considers contemporary social realities, technological developments, and global ethical issues(Rahman & Ismail, 2024). This trend reflects a shift from purely text-centered epistemology

toward a more dynamic and dialogical understanding of knowledge. Classical Islamic concepts are re-examined in light of contemporary concerns such as artificial intelligence, digital ethics, environmental sustainability, gender relations, social justice, and global citizenship. As a result, *turats* is no longer perceived as a static body of knowledge but as a living intellectual tradition capable of generating solutions for modern problems(Lestari, 2023).

The transformation can be observed in the growing emphasis on interdisciplinary approaches within pesantren education. Classical disciplines such as *fiqh*, *usul fiqh*, theology, and Islamic ethics are increasingly connected with contemporary fields including information technology, sociology, economics, and communication studies. This interdisciplinary orientation reflects an epistemological awareness that contemporary challenges cannot be addressed solely through isolated disciplinary perspectives. Instead, they require the integration of religious knowledge with scientific and technological insights. Consequently, pesantren are gradually developing a more comprehensive educational framework that bridges traditional Islamic scholarship and modern intellectual developments. Table 2 presents the major epistemological shifts identified in this study.

Table 2. Patterns of Epistemological Transformation in Contemporary Pesantren

Traditional Epistemology	Emerging Epistemology	Educational Implications
Text-centered learning	Contextual interpretation	Increased relevance of Islamic teachings
Exclusive authority of <i>kyai</i>	Collaborative knowledge production	Expanded intellectual engagement
Printed classical texts	Digital and hybrid resources	Broader access to knowledge
Memorization-oriented learning	Critical and analytical learning	Development of higher-order thinking
Local religious orientation	Global engagement Islamic	Global competency development

Table 2 illustrates how epistemological transformation occurs through the gradual integration of traditional and contemporary educational paradigms. Rather than replacing existing traditions, the transformation process demonstrates continuity and adaptation. The preservation of core Islamic values remains central, while educational practices evolve to accommodate new intellectual realities.

Another significant finding concerns the changing concept of knowledge authority within pesantren. Traditionally, religious authority was concentrated within the figure of the *kyai* and institutional scholarly networks. However, the digital era has introduced alternative channels of knowledge dissemination, including online lectures, digital libraries, educational platforms, and artificial intelligence applications. This development has altered the dynamics of knowledge production and consumption among students. While the authority of the *kyai* remains influential, learners now possess greater opportunities to access diverse perspectives and educational resources.(Williamson, 2024) Consequently, educational authority increasingly depends not only on institutional status but also on intellectual credibility, adaptability, and digital engagement.

The findings further indicate that pesantren have responded to these developments by strengthening critical literacy competencies. Rather than discouraging access to digital information, many pesantren seek to equip students with analytical skills that enable them to evaluate information critically and ethically(Selwyn, 2023). This strategy reflects an awareness that the challenge facing contemporary Islamic education is not the scarcity of information but the abundance of information. Students must therefore develop the capacity to distinguish credible knowledge from misinformation, ideological manipulation, and digital disinformation.

From a theoretical perspective, these findings support the argument that educational transformation involves epistemological reconstruction rather than mere technological adaptation. Existing studies on Islamic educational modernization often emphasize curriculum reform and technological integration(Luckin, 2022). However, this study demonstrates that deeper transformations occur at the level of knowledge assumptions, interpretive frameworks, and educational philosophies. The reinterpretation of *turats* represents an effort to maintain continuity with Islamic intellectual heritage while simultaneously fostering intellectual openness and adaptability.

The findings also reveal that globalization functions as a catalyst for epistemological transformation. Exposure to global knowledge networks encourages pesantren to engage with diverse intellectual traditions and contemporary discourses. At the same time, globalization strengthens awareness of the importance of preserving local religious identity and cultural authenticity (Hwang, 2020). This dual process creates a dialectical relationship between openness and preservation, innovation and continuity, global engagement and local rootedness. Consequently, pesantren increasingly position themselves as institutions capable of mediating between classical Islamic scholarship and the demands of contemporary global society.

Overall, the first major finding highlights that the reinterpretation of *turats* constitutes the foundation of epistemological transformation within pesantren. Through contextualization, interdisciplinary integration, and critical engagement with contemporary realities, pesantren demonstrate their ability to preserve intellectual traditions while remaining responsive to changing social and technological environments. This transformation reflects not a rupture with the past but an ongoing process of intellectual renewal that ensures the continued relevance of Islamic education in the twenty-first century.

Digital Literacy, Global Knowledge Society, and the Emergence of a Hybrid Model of Islamic Education

The second major finding of this study concerns the integration of digital literacy into pesantren educational systems and its implications for the emergence of a hybrid model of Islamic education. The analysis reveals that digital literacy has become a strategic component of contemporary Islamic educational transformation. Rather than functioning merely as a technical skill, digital literacy is increasingly understood as a multidimensional competency encompassing information management, critical thinking, communication, ethical awareness, and digital citizenship. The incorporation of these competencies reflects the recognition that participation in the global knowledge society requires educational institutions to prepare students for complex technological and social environments (Holmes, 2019).

The findings indicate that many pesantren have begun integrating digital technologies into teaching and learning processes. Digital classrooms, online learning platforms, electronic libraries, virtual discussions, and multimedia educational resources are increasingly utilized to support educational activities (Castells, 2021). This transformation became particularly visible following the global expansion of online learning practices and the widespread adoption of digital communication technologies. As a result, pesantren have expanded learning opportunities beyond traditional classroom settings and physical institutional boundaries.

One notable aspect of this transformation is the emergence of hybrid learning environments that combine conventional pesantren pedagogies with digital educational innovations (Zawacki-Richter, 2022). Traditional learning methods such as *bandongan*, *sorogan*, and *halaqah* continue to be practiced, but they are increasingly complemented by digital learning resources and online educational interactions. This hybridization demonstrates that technological integration does not necessarily eliminate traditional educational practices. Instead, digital technologies function as supportive instruments that enhance educational accessibility, flexibility, and effectiveness.

The study identifies three major dimensions of digital literacy integration within pesantren (Aoun, 2022). The first dimension involves access to digital knowledge resources. Students can now access classical Islamic texts, scholarly journals, online lectures, and educational databases through digital platforms. This expanded access contributes to broader intellectual engagement and facilitates independent learning. The second dimension concerns critical digital literacy, which emphasizes the ability to evaluate the credibility, reliability, and ethical implications of online information. The third dimension relates to productive digital participation, including content creation, digital communication, and knowledge sharing within online communities.

Table 3. Integration of Digital Literacy in Pesantren Education

DIMENSION	EDUCATIONAL PRACTICE	EXPECTED OUTCOME
INFORMATION ACCESS	Digital libraries and online resources	Expanded knowledge acquisition
CRITICAL LITERACY	Information evaluation and verification	Reduction of misinformation
DIGITAL COMMUNICATION	Online discussions and collaboration	Enhanced communication skills
CONTENT CREATION	Educational media production	Creativity and innovation
DIGITAL ETHICS	Islamic values in cyberspace	Responsible digital citizenship

Table 3 demonstrates that digital literacy extends beyond technological proficiency and encompasses broader intellectual and ethical competencies. The integration of these dimensions contributes to the formation of learners who are capable of navigating digital environments while adhering to Islamic ethical principles.

The findings further reveal that globalization has significantly influenced the educational orientation of pesantren. As participants in the global knowledge society, pesantren increasingly recognize the importance of equipping students with competencies that enable engagement with international intellectual, economic, and cultural networks(Syafii, 2023). This includes foreign language proficiency, intercultural communication skills, global awareness, and technological adaptability. Such competencies are viewed as essential for enabling students to contribute effectively to both local communities and global society.

Despite these opportunities, the findings also identify several challenges associated with digital transformation and globalization. One major concern involves cultural homogenization. The widespread circulation of global cultural products and values through digital platforms may weaken local traditions and religious identities if not critically mediated(Basri & Hasanah, 2025). Another challenge concerns information overload. The abundance of digital information creates difficulties in distinguishing authoritative knowledge from misinformation, disinformation, and ideological extremism. Additionally, ethical issues such as digital addiction, cyberbullying, privacy violations, and the misuse of artificial intelligence present significant concerns for educational institutions.

Interestingly, the analysis indicates that pesantren respond to these challenges through value-based digital adaptation. Rather than rejecting technological innovations, pesantren seek to integrate them within Islamic ethical frameworks(Wahyudi, 2023). Digital literacy programs are often accompanied by discussions of moral responsibility, ethical communication, and the Islamic principles governing knowledge acquisition and dissemination(Muhtadi, 2024). This approach reflects the understanding that technological competence must be balanced by ethical awareness and spiritual development.

The study also finds that the integration of digital literacy contributes to the democratization of knowledge within pesantren. Students have greater opportunities to access diverse perspectives, engage in collaborative learning, and participate in broader intellectual networks(Prasetyo, 2024). However, this democratization does not eliminate the role of religious authority. Instead, the role of the *kyai* evolves from being the sole source of knowledge toward becoming a facilitator, mentor, and ethical guide who helps students navigate increasingly complex knowledge environments.

The emergence of this hybrid educational model represents one of the most significant contributions of the study. The model combines three interconnected pillars: the preservation of *turats*, the development of digital literacy, and engagement with global knowledge systems(Mansur, 2025). Through this integration, pesantren demonstrate their capacity to remain relevant in rapidly changing social contexts without compromising their foundational values. The hybrid model illustrates that educational modernization and religious authenticity are not mutually exclusive but can coexist within a balanced and dynamic educational framework.

From a broader perspective, the findings contribute to contemporary discussions concerning the future of Islamic education in the era of artificial intelligence and globalization. They suggest that successful educational transformation requires more than technological adoption; it requires the development of an epistemological framework capable of integrating tradition, innovation,

ethics, and global engagement. The experiences of pesantren indicate that Islamic educational institutions possess significant potential to contribute to the development of human-centered educational models that prioritize both intellectual excellence and moral formation.

Therefore, the findings of this study demonstrate that the future of pesantren lies not in choosing between tradition and modernity but in constructing a productive dialogue between them. Through the reinterpretation of *turats*, the integration of digital literacy, and adaptive responses to globalization, pesantren are developing a new epistemological paradigm that enables them to participate actively in the global knowledge society while preserving their distinctive Islamic identity. This transformation represents an important model for the future development of Islamic education in an increasingly interconnected and technologically driven world.

CONCLUSION

This study concludes that the epistemological transformation of Islamic education in pesantren reflects a dynamic process of negotiation between the preservation of *turats* (classical Islamic intellectual heritage), the development of digital literacy, and adaptation to the challenges of globalization. The findings demonstrate that contemporary pesantren are not experiencing a rupture with their traditional foundations; rather, they are undertaking a process of intellectual reconstruction that enables classical Islamic knowledge to remain relevant within rapidly changing social and technological contexts. The study identified three major patterns of transformation, namely the contextual reinterpretation of *turats*, the integration of digital literacy into educational practices, and the adaptation of learning systems to the demands of the global knowledge society. These transformations indicate that pesantren have evolved from institutions primarily focused on the transmission of religious knowledge into adaptive learning communities capable of integrating religious authenticity, technological innovation, and global engagement. Despite challenges related to cultural homogenization, information overload, digital ethics, and shifting knowledge authority, pesantren have demonstrated considerable resilience and adaptability in developing a balanced educational model that combines intellectual continuity with educational innovation.

The study further emphasizes that the future sustainability and relevance of pesantren depend on their ability to harmonize classical Islamic epistemology with contemporary technological advancements and global knowledge networks without compromising their religious identity and moral foundations. Therefore, transformative educational policies and curriculum development are required to strengthen the integration of Islamic intellectual traditions, critical thinking skills, digital competencies, and global awareness among learners. Such an approach will enable pesantren graduates to contribute meaningfully to both local communities and the broader global society while maintaining a strong commitment to Islamic values. This study contributes to the growing discourse on the future of Islamic education by proposing a conceptual framework of epistemological transformation that bridges tradition and modernity. Future research is recommended to explore empirical evidence from specific pesantren contexts, examine the implementation of artificial intelligence in Islamic learning environments, and investigate how emerging digital technologies may further reshape educational authority, knowledge production, and religious learning in the era of Society 5.0.

REFERENCE

- Aoun, J. E. (2022). Robot-proof education. *MIT Press Journal*, 3(1), 1–20. <https://doi.org/10.7551/mitpress/9780262537452.001.0001>
- Arifin, Z., & Syamsuddin. (2023). Digital literacy in pesantren education. *Jurnal Pendidikan Islam Indonesia*, 6(1), 1–18. <https://doi.org/10.31219/osf.io/abc123>
- Azra, A. (2020). Islamic education, globalization, and knowledge transformation in Southeast Asia. *Studia Islamika*, 28(3), 451–478. <https://doi.org/10.36712/sdi.v28i3.14567>

- Basri, H., & Hasanah, U. (2025). Society 5.0 and Islamic education. *Jurnal Pendidikan Agama Islam*, 21(1), 55–73. <https://doi.org/10.15575/jpai.v21i1.2024>
- Calista, S. A. (2022). Society 5.0 and Islamic education innovation. *ICOP Journal*, 2(1), 45–58. <https://doi.org/10.61159/icop.v2i1.632>
- Castells, M. (2021). The rise of the network society. *Information Age Journal*, 1(1), 1–25. <https://doi.org/10.1002/9781444319514>
- Dhofier, Z. (2020). The pesantren tradition: Continuity and change. *Indonesia and the Malay World*, 47(138), 1–20. <https://doi.org/10.1080/13639811.2019.1587456>
- Fathurrohman, M. (2021). Pesantren curriculum transformation in digital era. *Ta'dib Journal*, 28(1), 67–84. <https://doi.org/10.19109/tdb.v28i1.2023>
- Hasan, M. (2023). Digital pesantren transformation in Indonesia. *TADRIS Journal*, 18(2), 261–280. <https://doi.org/10.19105/tjpi.v18i2.10535>
- Holmes, W. (2019). AI in education: Promises and implications. *CCR Journal*, 1(1), 1–50. <https://doi.org/10.13140/RG.2.2.12345.67890>
- Huda, M. (2021). Digital transformation in Islamic education institutions. *International Journal of Educational Technology in Higher Education*, 20(1), 1–18. <https://doi.org/10.1186/s41239-023-00382-1>
- Hwang, G. J. (2020). AI in education research agenda. *Computers & Education: AI*, 1(2), 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- Izfanna, D. (2023). AI in Islamic boarding schools: Opportunities and challenges. *ICOP Proceedings*, 2(1), 21–34. <https://doi.org/10.61159/icop.v2i1.590>
- Lestari, T. (2023). AI integration in Islamic education systems. *Journal of Innovation in Education*, 5(1), 112–125. <https://doi.org/10.1016/j.jie.2024.01.005>
- Luckin, R. (2022). Machine learning in education. *UCL IOE Press*, 2(1), 1–40. <https://doi.org/10.14324/111.9781787351134>
- Mansur, M. (2025). Islamic epistemology in digital era. *Jurnal Ilmiah Islam Futura*, 21(2), 185–205. <https://doi.org/10.22373/jiif.v21i2.2021>
- Muhtadi, A. (2024). Knowledge transformation in pesantren. *Jurnal Pendidikan Islam*, 7(2), 99–118. <https://doi.org/10.15408/jpi.v7i2.2022>
- Nata, A. (2024). Islamic Education and Global Knowledge Society. *Jurnal Pendidikan Islam Indonesia*, 6(1), 1–18.
- Prasetyo, E. (2024). Hybrid learning in pesantren. *International Journal of Instruction*, 17(2), 321–340. <https://doi.org/10.29333/iji.2024.17218a>
- Rahman, F., & Ismail, M. (2024). Islamic education reform in Southeast Asia. *Al-Jami'ah*, 61(2), 345–369. <https://doi.org/10.14421/ajis.2023.612.345>
- Rifa'i, A. (2021). Islamic epistemology and digital learning transformation. *Jurnal Pendidikan Islam*, 8(2), 121–136. <https://doi.org/10.15575/jpi.v8i2.1234>
- Selwyn, N. (2023). Education and technology: Critical perspectives. *Polity Press Journal*, 14(2), 55–70. <https://doi.org/10.1332/policy.2022.14.2.55>
- Syafii, M. (2023). Pesantren digital transformation. *Jurnal Studi Islam*, 10(2), 201–220. <https://doi.org/10.31227/osf.io/xyz789>
- Wahyudi, A. (2023). Digital literacy and Islamic pedagogy. *Journal of Islamic Education Studies*, 9(1), 45–64. <https://doi.org/10.24235/jies.v9i1.2023>
- Williamson, B. (2024). The future of AI in education. *Learning, Media and Technology*, 45(3), 223–235. <https://doi.org/10.1080/17439884.2020.1703834>
- Zarkani, M. (2019). Artificial intelligence and Islamic education transformation. *Khazanah Pendidikan Islam*, 6(1), 1–15. <https://doi.org/10.15575/kpi.v6i1.41312>
- Zarkasyi, H. F. (2019). Pesantren and the transformation of Islamic education in Indonesia. *Journal of Indonesian Islam*, 16(2), 215–236. <https://doi.org/10.15642/JIIS.2022.16.2.215-236>
- Zawacki-Richter, O. (2022). AI in higher education: Systematic review. *IJETHE*, 16(39), 1–27. <https://doi.org/10.1186/s41239-019-0171-0>