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The Transformation of Islamic Boarding Schools in the Digital Era: A Case Study of Three Islamic Educational Institutions in Indonesia

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ABSTRACT

This study investigates how Islamic boarding schools respond to digital transformation while maintaining religious traditions and core Islamic values. The research focuses on identifying leadership strategies, management practices, and learning innovations implemented to harmonize technological advancement with pesantren traditions. Employing a qualitative intrinsic case study design, the study was conducted in three Islamic boarding schools in Indonesia: Al-Muayyad (Solo), Nurul Jadid (Probolinggo), and IMMIM Putra (Makassar). Data were gathered through in-depth interviews, participatory observations, and document analysis, and subsequently examined using thematic analysis based on the Braun and Clarke framework. The findings reveal that digital transformation in pesantren extends beyond the adoption of digital tools and involves a fundamental shift in leadership orientation and educational management. Kyai play a central role as value-based transformational leaders who guide digital innovation while safeguarding spiritual principles and ethical learning traditions. The institutions developed hybrid learning models that integrate classical halaqah and tahfidz practices with digital platforms such as e-learning systems and online da'wah media. However, challenges remain, particularly related to uneven technological infrastructure and limited digital literacy among educators. This study proposes a conceptual model of value-based leadership in pesantren digital transformation and offers strategic insights for Islamic education policy development that remains adaptive to technological change while rooted in traditional values.

Keywords: Islamic Boarding School, Digital Transformation, Hybrid Learning, Value-Based Leadership, Islamic Education

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PENDAHULUAN

Digital transformation in education has emerged as an increasingly prominent global phenomenon over the past five years, marked by the widespread penetration of information technology, the development of online learning systems, and a paradigm shift in educational management toward more adaptive and sustainable models (Dimyathi et al., 2025; Sugito, 2024; Setiawan, 2025). Within the context of Islamic education, this dynamic presents more complex challenges, particularly for *pondok pesantren* as traditional educational institutions that emphasize character formation, scholarly ethics (*adab*), and the internalization of spiritual values (Fahrurrosi et al., 2025), (Prayogi et al., 2025), (Fuadiy et al., 2025). Pesantren are not only required to adopt digital technologies to enhance the effectiveness of learning and educational management, but they must also ensure that the digitalization process does not undermine Islamic identity and long-established pedagogical traditions (Nazyrova et al., 2025), (Zhukabayeva et al., 2025), (Kayanja et al., 2025).

Recent studies indicate that digital transformation in education cannot be understood merely as the utilization of technological devices or online learning platforms (Njå & Munthe,

n.d.). Rather, such transformation entails fundamental changes in leadership, organizational culture, learning systems, and human resource readiness in responding to technological change (Tahir & Rachman, 2025), (Wahab, 2024), (Wahab, 2024). Research on digital leadership and hybrid learning underscores that the success of educational transformation is strongly influenced by leadership vision, educators' digital literacy, and the alignment of institutional policies with organizational values (Hu, 2026), (Yulin & Danso, 2025), (Uture & Jamaluddin, 2025). Nevertheless, most of these studies primarily focus on public schools, formal madrasahs, or higher education institutions, and therefore do not fully represent the distinctive characteristics of pesantren as Islamic educational institutions grounded in tradition and the scholarly authority of the *kyai*.

Over the past five years, scholarly attention to the digitalization of pesantren has begun to grow, particularly studies highlighting the use of Learning Management Systems (LMS), *tahfidz* applications, and digital media for da'wah and learning [(Yan et al., 2024), (Dimyathi et al., 2025)]. However, these studies tend to be partial and descriptive in nature and have not yet examined the digital transformation of pesantren comprehensively within the framework of leadership and educational management (Dimyathi et al., 2025). Moreover, the relationship between Islamic value-based leadership and the process of digital transformation remains underexplored, leaving the existing literature unable to adequately explain how pesantren can pursue digital innovation without compromising values of *adab*, *akhlaq*, and scholarly traditions (*Transformation Of Islamic Boarding School Culture In The Digital Era : Collaboration Of Local Values And Global Competence*, n.d.).

In response to these research gaps, this study aims to address the limitations of previous scholarship by conducting an in-depth exploration of digital transformation in pesantren through a value-based leadership perspective. The research focuses on pesantren strategies in balancing the preservation of Islamic traditions with the integration of digital technology in educational management and learning practices (Dimyathi et al., 2025). Unlike prior studies that emphasize technological aspects, this research positions the leadership of the *kyai* and educational management systems as key elements in shaping contextual, ethical, and sustainable hybrid learning models.

The central argument examined in this study is that the success of digital transformation in pesantren is not solely determined by technological availability, but rather depends heavily on value-based leadership capable of translating Islamic principles into adaptive digital strategies oriented toward educational excellence (Islam et al., 2025). Employing an intrinsic case study approach across three pesantren in Indonesia, this study analyzes leadership practices, educational management, and the development of hybrid learning as manifestations of pesantren digital transformation. The article is systematically structured, beginning with the theoretical and methodological foundations of the study, followed by the presentation of findings and discussion, and concluding with conclusions and both theoretical and practical implications for the development of Islamic education in the digital era.

METHOD

This study employed a qualitative research approach with an intrinsic multiple-case study design to explore the process of digital transformation in Islamic boarding schools. The qualitative approach was selected because it enables an in-depth understanding of complex social, cultural, and organizational phenomena within their natural contexts, particularly when examining leadership practices, educational management, and value-based transformation processes (Braun & Clarke, 2023), (Barouki et al., 2021). A case study design was considered appropriate as it allows for a comprehensive exploration of bounded systems and facilitates rich contextual analysis of institutional practices that cannot be adequately captured through quantitative methods (Råbu & Binder, 2025).

The research was conducted in three Islamic boarding schools located in different regions of Indonesia, namely Pesantren Al-Muayyad (Solo), Pesantren Nurul Jadid (Probolinggo), and Pesantren IMMIM Putra (Makassar). These sites were purposively selected

to represent diverse organizational structures, technological readiness levels, and leadership styles. The unit of analysis in this study was the institutional process of digital transformation, with particular emphasis on leadership, educational management, and hybrid learning practices (Tajik et al., 2024). The research was carried out over a four-month period to ensure prolonged engagement and sufficient immersion in each research setting (Dado et al., 2023).

The researcher served as the primary research instrument, as is common in qualitative case study research, enabling direct interaction with participants and in-depth interpretation of contextual data (Moser & Korstjens, 2018). Research participants consisted of kyai and pesantren leaders, administrators responsible for academic and digital programs, teachers involved in conventional and digital learning, as well as students actively participating in hybrid learning activities. Informants were selected using purposive sampling based on their roles and relevance to the research focus, while snowball sampling was applied to identify additional participants who could provide critical insights into the digital transformation process (Sutherland, 2015).

Data collection was conducted through semi-structured in-depth interviews, participatory observations, and document analysis. Interviews were used to explore participants' perspectives on leadership, digital strategy, and educational change, allowing flexibility to probe emerging themes during the interaction (Gussmann et al., 2021). Observations were carried out to capture real-time learning practices, leadership interactions, and the use of digital technologies in daily pesantren activities. Document analysis involved the examination of institutional policies, strategic plans, digital learning modules, and internal reports related to educational management and technology integration (Barouki et al., 2021).

Data analysis was performed using thematic analysis following a systematic and iterative procedure, including data familiarization, coding, theme development, theme review, and interpretation (Dahal, 2025). This approach was chosen due to its flexibility and suitability for identifying patterns across multiple qualitative data sources. To enhance the trustworthiness of the findings, data triangulation across interviews, observations, and documents was applied, along with member checking to validate interpretations with participants (Dahal, 2025). Additionally, an audit trail and reflective field notes were maintained throughout the research process to ensure methodological transparency and analytical rigor.

RESULT AND DISCUSSION

The research findings were generated through a thematic analysis of qualitative data obtained from in-depth interviews, participant observation, and document analysis conducted across three pesantren. Rather than presenting digital transformation as a uniform or linear process, the analysis revealed three interrelated themes that collectively characterize the distinctive nature of pesantren digital transformation: (1) value-based leadership as the driving force of digitalization, (2) the emergence of contextually grounded hybrid learning models, and (3) persistent structural and human-resource-related challenges.

The first theme demonstrates that digital transformation in pesantren is not perceived merely as a technocratic or efficiency-oriented process, but as a value-laden endeavor closely tied to the reinforcement of Islamic norms and educational ethics. Kyai and pesantren leaders function as the primary agents of change, exercising moral authority to frame digital technology as an instrument for strengthening *adab*, *akhlaq*, and scholarly discipline. Rather than displacing traditional learning practices, digital initiatives are deliberately designed to support and extend the halaqah system. This finding indicates that value-based leadership operates not only as a normative guide, but also as a strategic mechanism that legitimizes digital innovation within the pesantren cultural framework, thereby ensuring the sustainability of transformation efforts.

The second theme concerns the development of hybrid learning models that integrate classical pedagogical methods such as *sorogan*, *bandongan*, and *halaqah* with digital technologies, including Learning Management Systems (LMS), *tahfidz* applications, and online *da'wah* platforms. Hybrid learning in pesantren is not implemented as a standardized model, but rather as a contextual configuration shaped by institutional vision, leadership orientation, and resource availability. This approach allows pesantren to preserve the epistemological and

spiritual characteristics of classical Islamic learning while simultaneously enhancing instructional flexibility, accessibility, and responsiveness to contemporary educational demands. Importantly, technology is positioned as a pedagogical extension rather than a substitute for face-to-face religious instruction.

The third theme highlights ongoing challenges that constrain the optimization of digital transformation. These challenges include uneven technological infrastructure, limited access to digital devices, and varying levels of digital literacy among educators. Resistance to change, particularly among senior teachers accustomed to conventional pedagogical practices, further complicates implementation. These findings suggest that digital transformation in pesantren is shaped not only by technological capacity, but also by human readiness and organizational culture. Consequently, digitalization emerges as a negotiated process rather than a purely technical intervention.

To illustrate cross-case variations, Table 1 summarizes traditional learning forms, digital technologies utilized, and levels of integration across the three pesantren. The table underscores that higher levels of digital integration are closely associated with leadership commitment and institutional policy support, rather than with technological availability alone.

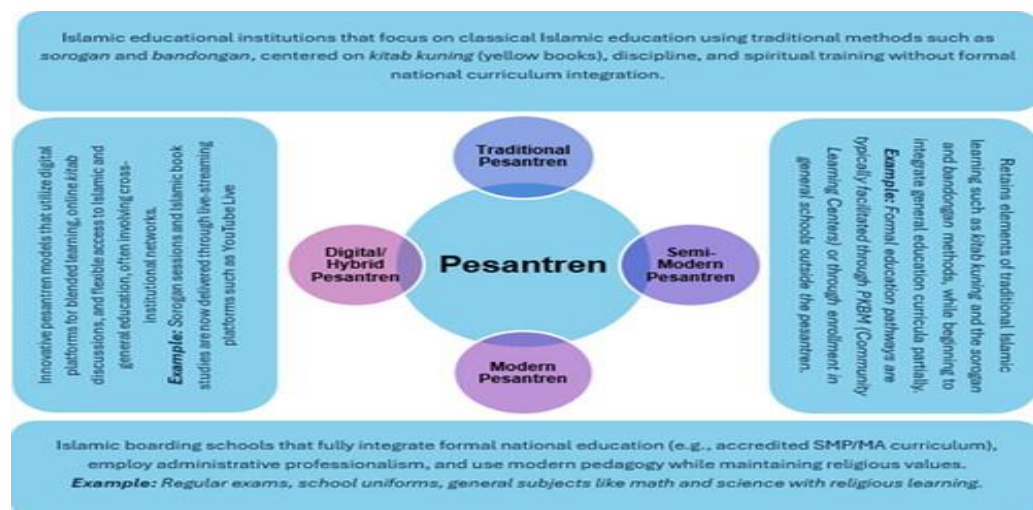
Table 1. Hybrid Learning Implementation in Islamic Boarding Schools

No	Pesantren	Traditional Learning Methods	Digital Technologies Used	Integration Level
1	Al-Muayyad (Solo)	Sorogan, Bandongan, Halaqah	LMS, Tahfidz App, Live Streaming	High
2	Nurul Jadid (Probolinggo)	Sorogan, Madrasah System	LMS, Tahfidz App, Telegram Groups	Moderate High
3	IMMIM Putra (Makassar)	Halaqah, Formal Schooling	E-learning, YouTube Dakwah	Moderate

Source: Data Analysis

Note: The level of digital integration is determined based on the frequency of technology use and the extent of its integration into daily learning activities.

Figure 1 Conceptual Model of Value-Based Digital Transformation in Islamic Boardin



Source: Data Analysis

The figure illustrates the conceptual relationship between value-based leadership, educational management, hybrid learning, and Islamic educational excellence as the outcome of digital transformation.

Discussion

The findings of this study demonstrate that digital transformation in pesantren is a multidimensional process encompassing leadership reorientation, educational management

restructuring, and pedagogical innovation. This aligns with broader digital transformation theories which emphasize that technological adoption must be accompanied by shifts in organizational culture and leadership to generate sustainable impact (Karakose et al., 2024); Liu et al., 2024) Within the pesantren context, however, such transformation is inseparable from the moral authority of the *kyai*, whose role extends beyond administrative leadership to encompass ethical stewardship and spiritual guidance.

The prominence of value-based leadership in this study reinforces previous research on transformational and spiritual leadership in education (Hudaa et al., 2024), yet extends existing theory by demonstrating that Islamic values function not merely as complementary ethical considerations, but as a strategic framework for policy formulation and institutional decision-making. In this sense, the study reconfigures the concept of digital leadership by positioning religious values at the core rather than the periphery of digital transformation processes in Islamic educational institutions.

The implementation of hybrid learning in pesantren supports hybrid learning theory, which posits that the integration of face-to-face and digital learning can enhance learning quality and flexibility. Nevertheless, field findings indicate that the hybrid model in pesantren is distinctive, as it continues to position the *halaqah* as the central locus of learning, while technology functions as a supporting tool. This provides a novel conceptual contribution to the development of hybrid learning theory within the context of traditional Islamic education.

Furthermore, the implementation of hybrid learning in pesantren supports hybrid learning theory, which posits that the integration of face-to-face and digital modalities enhances learning quality and flexibility (Niță & Guțu, 2023) Nevertheless, this study reveals a distinctive pesantren-specific hybrid model in which the *halaqah* remains the epistemic and spiritual center of learning, while digital technology functions as a complementary tool. This finding contributes a novel contextual refinement to hybrid learning theory by demonstrating how traditional religious pedagogies can coexist with digital innovation without undergoing epistemological displacement.

The challenges related to digital literacy and infrastructure identified in this study are consistent with previous research emphasizing that human resource readiness and institutional policy support are critical factors in educational digital transformation. This study affirms that without sustained investment in educator competency development and technological infrastructure, pesantren digitalization risks stagnation. By integrating empirical findings with recent literature, this research enriches the discourse on Islamic educational management by proposing a value-based digital transformation model for pesantren that balances tradition and innovation.

The challenges related to digital literacy and technological infrastructure identified in this study are consistent with prior research emphasizing the importance of human resource readiness and institutional policy support in educational digital transformation (Niță & Guțu, 2023); (Olabiya et al., 2025). However, this study further highlights that resistance to digital change in pesantren is often rooted in concerns over value erosion rather than technical incapacity alone. By integrating empirical findings with recent literature, this research advances Islamic educational management scholarship through the proposal of a value-based digital transformation model that explicitly balances tradition and innovation as mutually reinforcing dimensions.

The main finding of this study demonstrates that digital transformation in Islamic boarding schools (pesantren) is predominantly shaped by value-based leadership rather than by technological readiness or infrastructural capacity alone. This finding contrasts with a substantial body of recent educational management literature that conceptualizes digital transformation primarily through the lenses of digital infrastructure development, system integration, and institutional policy alignment as key success factors (Graham et al., 2023; Prosen & Ličen, 2025; Greenhow et al., 2022). While previous studies largely frame digital leadership as a strategic-managerial function oriented toward innovation efficiency, data-driven governance, and organizational performance, the present research reveals that within the pesantren context, leadership legitimacy is fundamentally grounded in moral authority and

the kyai's capacity to translate Islamic values such as *adab*, *akhlaq*, and scholarly ethics into digital management practices. In contrast to earlier studies on faith-based or traditional education that remain largely descriptive and technology-centered (Boelens et al., 2018), this study advances a novel conceptualization of digital transformation as a culturally embedded and value-mediated leadership process. The novelty of this research lies in its articulation of a value-based digital transformation model that positions religious values not as peripheral ethical considerations, but as strategic managerial resources that actively shape decision-making, hybrid learning design, and organizational change. By empirically demonstrating how traditional religious authority can coexist with and legitimize digital innovation, this study extends contemporary management and educational leadership theories into underexplored faith-based institutional settings and contributes to the growing global discourse on value-driven digital transformation in education.

Differences Between the Main Findings and Previous Studies

The main findings of this study differ fundamentally from previous research on digital transformation in education, which predominantly conceptualizes digitalization as a technology-centered or system-efficiency process emphasizing platforms, automation, and data-driven governance (Tondeur et al., 2024). While earlier studies frame digital transformation largely through organizational readiness, digital infrastructure, and technological leadership competencies (Davis et al., 2024a), this study demonstrates that in pesantren contexts, value-based leadership rooted in religious authority functions as the primary driver of digital change. Unlike prior findings that treat institutional values as contextual moderators (Ifenthaler et al., 2021; Barton & Dexter, 2020), the present research shows that Islamic values actively structure managerial decision-making, pedagogical design, and digital governance. Moreover, whereas dominant hybrid learning studies position digital platforms as parallel or substitutive learning environments (Ali, 2025), this study identifies a distinct pesantren-specific hybrid model in which traditional halaqah pedagogy remains epistemically central and digital tools serve a supportive managerial function. This divergence highlights a conceptual gap in existing digital transformation literature and extends it into faith-based and tradition-oriented educational institutions.

Implications of the Research

The implications of this research are substantial for educational management theory and practice. The findings suggest that prevailing digital transformation frameworks should be expanded beyond techno-managerial models to incorporate value-oriented and culturally embedded leadership dimensions (Davis et al., 2024b). For policymakers and institutional leaders, the study implies that investments in technology alone are insufficient without parallel development of leadership capacity, ethical governance, and human resource readiness (Hanelt et al., 2021a). In the context of Islamic and faith-based education, the findings demonstrate that digital innovation can coexist with institutional identity when transformation strategies are explicitly anchored in core values and pedagogical traditions. This positions value-based digital leadership as a strategic pathway for sustainable educational transformation in culturally rooted institutions.

Limitations of the Research

Despite its contributions, this study has several limitations that should be acknowledged. Methodologically, the qualitative multiple-case study design restricts the generalizability of the findings beyond the specific pesantren contexts examined (Yin et al., n.d.). The reliance on interviews, observations, and document analysis produces rich contextual insights but remains inherently interpretive and descriptive, limiting causal explanation (Braun & Clarke, 2025). Additionally, the study does not quantitatively measure learning outcomes, organizational performance, or long-term digital impact, which constrains the ability to compare the effectiveness of value-based digital transformation with alternative models (Bond et al., 2021). These limitations indicate that the findings should be interpreted cautiously and understood as context-specific contributions rather than universal claims.

Further Research Needs and Areas for Expansion

Future research should empirically test the value-based digital transformation model proposed in this study using quantitative or mixed-method approaches across broader institutional contexts. Longitudinal studies are needed to examine the sustainability of digital transformation initiatives and their long-term effects on student learning outcomes, character development, and graduate competitiveness (Hanelt et al., 2021b). Comparative research between faith-based and secular educational institutions could further illuminate how cultural and ethical values interact with digital governance and innovation strategies (Phillips et al., 2025). Additionally, future studies may explore the role of emerging technologies such as artificial intelligence in shaping value-sensitive digital education ecosystems.

CONCLUSION

This study cautiously concludes that digital transformation in pesantren is a multidimensional and value-laden process that cannot be reduced to the technical adoption of digital tools alone but is deeply shaped by leadership orientations, institutional readiness, and the integration of Islamic values such as *adab*, *akhlaq*, and scholarly ethics into educational governance and practice. Based on descriptive and context-specific evidence, the findings suggest that hybrid learning through the careful integration of traditional pedagogical methods (*halaqah*, *sorogan*, *tahfidz*) with digital technologies represents a pragmatic response to contemporary challenges, albeit one that remains highly contingent on human resource capacity, supportive policies, and adequate infrastructure. At the same time, persistent constraints, including uneven digital literacy, infrastructural disparities, and cultural resistance to change, indicate that digital transformation in pesantren is neither linear nor universally attainable without sustained capacity-building and organizational commitment. Theoretically, this study offers a value-based conceptual framework for understanding pesantren digital transformation that positions religious values as a foundational driver of change, while practically providing contextual insights for pesantren leaders and policymakers. Nevertheless, given the methodological limitations and the largely qualitative, descriptive nature of the data, these conclusions should be interpreted as exploratory, serving as an initial foundation for future empirical research on the broader educational, character-building, and competitiveness outcomes of digital transformation in Islamic educational institutions.

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