
DIGITAL TRANSFORMATION IN ISLAMIC BOARDING SCHOOLS: NEGOTIATING TRADITION, AUTHORITY, AND INNOVATION IN THE DISRUPTION ERA

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Abstrak

Artikel ini bertujuan menganalisis peluang, tantangan, dan strategi adaptasi pesantren dalam menghadapi transformasi digital, khususnya terkait pemanfaatan teknologi dalam pembelajaran kitab dan metode klasik pesantren. Penelitian ini menggunakan pendekatan kualitatif-deskriptif berbasis studi kepustakaan dengan analisis tematik terhadap literatur pendidikan pesantren dan transformasi digital. Hasil kajian menunjukkan bahwa transformasi digital pesantren tidak bersifat teknokratis semata, melainkan merupakan proses negosiasi nilai, otoritas keagamaan, dan tradisi keilmuan sebagai bentuk resiliensi kelembagaan pesantren di era disrupsi digital. Integrasi teknologi secara moderat berpotensi memperkuat pembelajaran dan literasi santri, selama tetap menempatkan kiai sebagai penjaga otoritas keilmuan. Kebaruan artikel ini terletak pada pembacaan transformasi digital pesantren sebagai proses sosial-kultural, bukan sekadar inovasi teknis, sehingga memberikan kontribusi konseptual bagi kajian pendidikan Islam kontemporer. Kontribusi penelitian ini adalah menawarkan kerangka analitis mengenai model adaptasi pesantren terhadap transformasi digital yang menyeimbangkan antara inovasi teknologi, pelestarian tradisi keilmuan, serta penguatan otoritas keagamaan sebagai fondasi keberlanjutan pendidikan pesantren di era digital.

Kata kunci: *Transformasi Digital; Negosiasi Nilai; Otoritas Keagamaan.*

Abstract

This article aims to analyze the opportunities, challenges, and adaptation strategies of Islamic boarding schools in facing digital transformation, especially regarding the use of technology in learning, as well as the role of books and classical Islamic boarding schools' methods. This study uses a qualitative-descriptive approach based on a literature review, with thematic analysis of the literature on Islamic boarding school education and digital transformation. The results of the study show that the digital transformation of Islamic boarding schools is not purely technocratic but a process of negotiating values, religious authority, and scientific traditions as a form of institutional resilience in the era of digital disruption. Moderate integration of technology has the potential to strengthen student learning and literacy, while still placing kiai as the guardian of scientific authority. The novelty of this article lies in reading the digital transformation of Islamic boarding schools as a socio-cultural process, not merely a technical innovation, thereby making a conceptual contribution to the study of contemporary Islamic education. The contribution of this research is to offer an analytical framework for the model of Islamic boarding schools' adaptation to digital transformation that balances technological innovation, the

preservation of scientific traditions, and the strengthening of religious authority as the foundation for the sustainability of Islamic boarding school education in the digital era.

Keywords: Digital Transformation; Value Negotiation; Religious Authority.

INTRODUCTION

The era of disruption is a phase in technological and social development where digital innovation is massively changing the way of working and living that pre-existed (Sabar, 2025). Nowadays, technology not only speeds up work processes but also creates new models that can weaken or replace older ones, particularly in transportation, communication, banking, and education (Amri, 2025). Disruption forces educational institutions to change. The teaching and learning process is no longer limited to physical classrooms but can also occur through online platforms, learning videos, and interactions with AI-based chatbots such as ChatGPT. This affects the role of teachers, who are no longer the only source of knowledge, but must be facilitators and guides in managing wider and more dynamic learning resources (Adabi, 2025).

Traditional Islamic educational institutions, such as Islamic boarding schools, are also not spared from the impact of ongoing changes (Zuraida, 2025). Learning traditions that previously relied on face-to-face methods, *halaqah*, *sorogan*, and *bandongan* are now forced to adapt to the use of digital media in the teaching process (Dhofier, 2011). This calls for a balance between maintaining traditional values and applying modern technology so that pesantren remain relevant in the midst of changing times (Mulyadi, 2023). The distinctive feature of pesantren is its integrated education system, which includes learning, character building, and intensive socio-religious life in a unique environment (Azra, 2012).

Several previous studies have discussed how pesantren respond to changes in the digital era. For example, a study by Azra (2021) shows that most Islamic boarding schools in Indonesia still have difficulty integrating digital technology due to limited infrastructure and a lack of skilled personnel. Another study by Ma'arif & Fadillah (2022) emphasizes the important role of kiai in driving digital transformation. They began introducing digital management systems, social media for da'wah campaigns, and distance learning via platforms such as Google Classroom and *Zoom*. Other studies also state that the adoption of this technology remains irregular and does not meet the same standards (Mulyadi, 2023). Therefore, this litterological study is presented as a solution to this gap by offering a strategic, systematic, and local context-based approach.

The novelty of this article lies in its analytical approach, which interprets the transformation of pesantren education not only as a process of technology adoption or digitalization but also as a complex negotiation among traditional values, religious authorities, and the pesantren education ecosystem in the context of digital disruption. This article aims to analyze the opportunities,



challenges, and adaptation strategies of pesantren in facing digital transformation, especially regarding the use of technology in learning, as well as the role of books and classical pesantren methods.

METHOD

This study uses a qualitative-descriptive approach with a literature study method. The qualitative-descriptive approach was chosen because it can describe and analyze the phenomenon of the transformation of Islamic boarding schools in the face of the era of disruption and technological development in depth and contextual (Creswell, 2014). The literature study method allows researchers to collect data from various written sources, such as books, scientific journals, articles, official documents, and digital literature that are relevant to the research theme (Bowen, 2009).

This research uses a qualitative approach with a library *research design*. The research data are sourced from academic books, reputable journal articles, and research reports relevant to pesantren education and digital transformation. Library sources were selected based on criteria of topic relevance, authorial authority, and alignment with the context of contemporary Islamic education. Data analysis is carried out through thematic and descriptive-analytical approaches, grouping the main ideas, comparing findings across authors, and synthesizing key concepts to build a systematic argumentation framework.

With this approach, the research focuses on understanding how Islamic boarding schools adapt to technological changes and identifying opportunities and strategies applied in the transformation process. Literature studies provide a theoretical basis and empirical data strong enough to support the analysis, without requiring direct data collection in the field. This makes this approach suitable for both conceptual and exploratory research.

To maintain the sharpness of the analysis, this study not only inventories the literature, but also conducts a conceptual synthesis by comparing various academic views on Islamic boarding schools, the digitization of education, and religious authority. The analysis was carried out interpretively to find patterns, trends, and implications of digital transformation on the pesantren education system.

RESULTS AND DISCUSSION

The results of the literature review confirm that pesantren remain the main pillar of Islamic education in Indonesia with a high level of socio-cultural resilience in the face of changing times. Since their inception, pesantren have not only functioned as institutions for the transmission of Islamic knowledge but also as centers for character formation, da'wah, and the social development of the people. The resilience of pesantren is mainly supported by a holistic education

system that integrates intellectual, spiritual, and social dimensions through the example of kiai, worship habits, and collective life in the dormitory environment. The synthesis of findings from the literature review on the digital transformation of Islamic boarding schools in this article is presented in Figure 1.

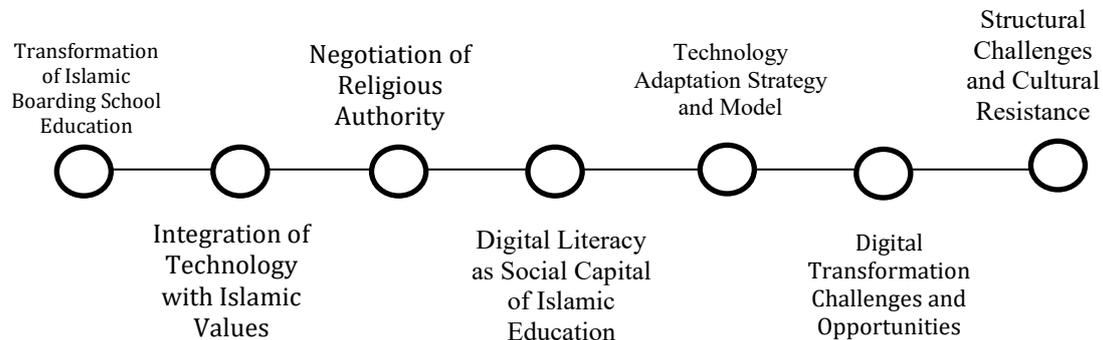


Figure 1. Synthesis Findings on the Digital Transformation of Islamic Boarding Schools

In the context of the Industrial Revolution 4.0, Islamic boarding schools face both challenges and opportunities. The literature shows that pesantren that survive are those that are flexible in responding to change without losing their identity. The basic values of Islamic boarding schools, such as sincerity, simplicity, independence, and Islamic *ukhuwah*, remain the main foundations that distinguish it from other educational institutions. These values have become very important social capital in the midst of the moral crisis and disorientation of values that often accompany the development of modern technology (Askar et al., 2025). However, the study's results also indicate that some Islamic boarding schools remain in a defensive position regarding technological developments. This cautious attitude arises because of concerns that modernization and digitalization will erode the tradition of Islamic boarding schools and weaken the scientific authority of kyai. Therefore, a comprehensive understanding is needed: technological adaptation does not have to be seen as a form of westernization or secularization, but as an instrument to strengthen the educational function of Islamic boarding schools.

Digital Transformation of Islamic Boarding Schools as a Process of Institutional Change

Digital transformation in pesantren education cannot be understood solely as a process of technology adoption but as a form of institutional change that involves adjusting norms, practices, and authority structures within the traditional Islamic education system. From the perspective of institutional change theory, educational organizations tend to adapt gradually through a negotiation process between external pressures and established internal values (Scott, 2014). Pesantren, as an Islamic educational institution that has a long tradition, shows the character of institutional resilience, namely the ability to maintain basic

identity while adapting to changes in the social environment.

Digital transformation in this context does not eliminate the tradition of pesantren, but rather gives rise to a process of reinterpreting classic educational practices such as sorogan, bandongan, and halaqah, so that they can function effectively in the digital ecosystem. This approach aligns with the view that educational transformation in the digital era often takes the form of hybrid institutionalization, integrating traditional practices and technological innovations. Islamic boarding schools that have successfully adapted generally do not replace classical learning methods but rather use technology to support and strengthen the process of transmitting Islamic knowledge.

Integration of Technology with Islamic Values

The integration of the traditional curriculum of Islamic boarding schools with technological skills is an important effort to equip students to face the challenges and opportunities of the current digital era. The pesantren curriculum, which has focused on teaching the Islamic Book and Islamic values, needs to be enriched with instruction in technological skills, such as using computers, the internet, and relevant digital applications. This approach not only maintains and preserves the tradition of Islamic science but also helps students develop adaptive and productive abilities in the modern world (Yusuf, 2025).

The combination of these two aspects can improve the quality of pesantren graduates and open up wider career opportunities without sacrificing Islamic values that are characteristic of pesantren (Fauzan, 2021). The implementation of this holistic curriculum requires adequate teacher training and infrastructure support to ensure the learning process runs effectively and sustainably. This study emphasizes that integrating technology with Islamic values is key to the success of Islamic boarding school digitalization. Digital-based Islamic learning platforms not only function as a medium for the transmission of knowledge, but also as a space for the production of contextual religious meanings. Therefore, the aspects of material authenticity, conformity with the traditions of Islamic boarding schools, and control by scientific authorities are crucial to ensure that digitalization does not lead to the commodification or simplification of Islamic teachings.

In addition, digitally based Islamic learning platforms not only serve as a medium for the transmission of religious knowledge but also help improve digital literacy and expand religious understanding that is contextualized within contemporary social realities. Through the use of digital technology, the religious learning process can take place in a more flexible, participatory, and supportive manner both in the pesantren environment and in domestic spaces such as the home (Hjarvard, 2016; Rahman, 2020).

In the development of the platform, it is necessary to pay attention to the aspects of the authenticity of the material, ease of use, and the availability of

features that are in line with the values of Islamic boarding schools and Islamic traditions so that they are maintained in the process of digitizing education.

Negotiating Religious Authority in the Digital Space

One important implication of digital transformation is a change in the distribution of religious authority. In the tradition of Islamic boarding schools, scientific authority has historically centered on the kiai, a figure whose legitimacy rests on scientific sanad, spiritual experience, and community recognition. However, the development of digital technology has created a new space for the production and distribution of religious knowledge through the internet, social media, and online learning platforms. This phenomenon reflects a process that some scholars refer to as the mediatization of religion, which is the shift of religious authority from traditional structures to digital media spaces (Hjarvard, 2016). In this context, religious authority is no longer completely monopolized by formal institutions, but is also produced through digital interactions, social networks, and open access to Islamic sources of knowledge.

For Islamic boarding schools, this situation creates a new dynamic. On the one hand, digital technology allows Islamic boarding schools to expand the reach of da'wah and Islamic education to a wider community. But on the other hand, there are concerns that uncontrolled access to information could weaken the traditional authority of the kiai as the guardian of scientific legitimacy. The findings of this study show that some pesantren respond to this situation with a strategy of reasserting authority, namely by strengthening the legitimacy of kiai authority through the integration of technology into the pesantren education system. In other words, technology does not replace the authority of the kiai but is used to expand their influence and scientific reach.

Digital Literacy as Social Capital of Islamic Education

In the context of digital transformation, digital literacy is an important competency for students and pesantren educators. Digital literacy is not only related to the technical ability to use technological devices, but also includes critical skills in assessing information, understanding the social media context, and maintaining digital communication ethics. Research on digital education shows that digital literacy has cognitive, social, and ethical dimensions (Livingstone, 2014). In the pesantren environment, this ethical dimension is highly relevant because it relates to Islamic moral values such as trust, honesty, manners, and social responsibility.

Therefore, the integration of digital literacy into pesantren education needs to be directed toward the development of digital ethics based on Islamic values. This approach allows students not only to become users of technology but also to become actors who use it critically, productively, and ethically. Some Islamic boarding schools have begun to develop the concept of *fiqh al-ma'lumat*, or information fiqh, as a normative approach to understanding the use of digital



technology. This approach provides an ethical framework for students to address various digital phenomena, such as the spread of hoaxes, hate speech, copyright infringement, and information manipulation on social media.

Technology Adaptation Strategies and Models as a Value Negotiation Process

The results of the study show that Islamic boarding schools can apply various adaptation strategies to face the challenges arising in the era of the Industrial Revolution 4.0. The main strategy that can be taken is to integrate technology into the learning process. The use of digital media, online learning applications, and pesantren information systems can increase the effectiveness and efficiency of education, while still maintaining the essence of traditional learning (Rumaelan, 2025).

The next strategy is to strengthen the competence of human resources in Islamic boarding schools. Increasing digital literacy, developing innovative learning methods, and strengthening the managerial capacity of pesantren managers are strategic steps that need to be taken sustainably. Based on several studies, Islamic boarding schools that actively participate in training and collaborate with other universities or institutions tend to be more able to adapt to changes. Curriculum innovation is also an important part of the pesantren adaptation strategy. The integration of religious and general sciences, as well as the development of entrepreneurial, technological, and communication skills, can increase the relevance of the education provided. This innovation does not aim to replace the traditional curriculum, but rather to enrich and expand the scope of student competencies.

Strengthening character education based on Islamic values remains the main strategy that should not be ignored. Pesantren have advantages in fostering morals and spirituality through the dormitory system and the example of kyai. These values need to be internalized in context to protect students from the negative impacts of globalization and digitalization. With adequate access to and tools for technology, pesantren can more freely integrate technology into the curriculum, thereby improving the quality of education and students' competitiveness in the digital era.

Cooperation between Islamic boarding schools and the government and the private sector is key to developing adequate technological facilities. This synergy allows pesantren to obtain financial support, access to infrastructure, and human resource training needed to improve the quality of technology-based education. Meanwhile, based on the synthesis of the literature analyzed, the digital transformation of pesantren can be understood through three main adaptation models:

First, the instrumental adaptation model

At this stage, technology is used mainly as a tool to improve the efficiency

of the learning process without fundamentally changing the structure of pesantren education. The use of technology is usually limited to communication media, the distribution of digital learning materials, or online platforms to support the teaching and learning process. In the study of digital education, this stage is often referred to as the early adoption phase of technology, in which educational institutions use technology to reinforce existing pedagogical practices without making significant structural changes (Selwyn, 2017).

Second, the integrative adaptation model

In the next stage, technology began to be integrated more systematically in the curriculum and learning practices of Islamic boarding schools. This integration can include developing students' digital literacy, using online learning platforms to teach the yellow book, and strengthening 21st-century skills such as collaboration, creativity, and technology-based problem-solving. This model shows the integration process between the Islamic boarding school education tradition and modern pedagogical innovations that utilize digital technology (Veletsianos, 2020).

Third, the transformative adaptation model

At this stage, technology no longer functions only as a learning tool but becomes part of broader institutional change. These transformations can include digitizing pesantren management, developing digital da'wah platforms, using social media to spread Islamic knowledge, and establishing technology-based education networks that connect Islamic boarding schools with the global community. From the perspective of digital religion studies, this transformation also affects the production and distribution patterns of religious authority in the digital public space (Campbell, 2012; Hoover, 2016).

Challenges and Opportunities for Digital Transformation of Islamic Boarding Schools

Digital transformation in pesantren education presents complex dynamics because it involves interactions among technological change, Islamic scientific traditions, and the institutional social structure of pesantren institutions. On the one hand, the development of information technology offers significant opportunities for Islamic boarding schools to improve the quality of education, expand access to learning, and strengthen the role of da'wah in the digital space. But on the other hand, the digitalization process is also faced with various structural and cultural challenges that cannot be ignored (Selwyn, 2017; Veletsianos, 2020).

One of the main challenges is the inequality of access to technology (digital divide) between Islamic boarding schools in urban and rural areas. Many traditional Islamic boarding schools still face limitations in their technological infrastructure, such as unstable internet access, limited digital devices, and a lack of human resources with information technology competence. This inequality is a



common phenomenon in the digital transformation of education in various developing countries, where limited infrastructure and digital capacity are the main obstacles to the implementation of educational technology (UNESCO, 2021; Selwyn, 2017).

In addition to infrastructure factors, resistance to change is an important challenge in the digital transformation of Islamic boarding schools. This resistance often arises in response to concerns that technological modernization can erode the traditional values of Islamic boarding schools that have been the foundation of education, such as the close relationship between kiai and students, the practice of learning the yellow book through the *bandongan* and *sorogan* methods, and the character development system based on collective life in the dormitory environment. From the perspective of organizational sociology and the theory of institutional change, this kind of resistance is not always interpreted as a rejection of innovation, but rather as a protective mechanism to maintain identity stability and institutional legitimacy (DiMaggio & Powell, 1983).

However, the development of digital technology also presents strategic opportunities for Islamic boarding schools to improve the quality of education. Advances in information technology have driven a major transformation in education through online learning platforms (e-learning). Online learning platforms allow the teaching and learning process to take place in a more flexible, interactive, and widely accessible manner without being limited by space and time (Muid, 2024; Veletsianos, 2020). In the context of formal and non-formal education, the use of digital platforms is an effective alternative to enrich learning methods and increase student participation.

Various digital learning applications provide features that support interaction between teachers and students, such as online discussion forums, interactive quizzes, multimedia-based material presentation, and real-time learning evaluation systems (Gunawan, 2020). The presence of this technology allows traditional learning methods to be enriched with a more adaptive approach to the characteristics of the digital generation, who are accustomed to the use of information technology in daily life (Haditia, 2024; Selwyn, 2017).

In the context of Islamic boarding schools, the integration of digital technology also opens up new opportunities to expand the reach of religious education. The teaching of the yellow book and various Islamic disciplines can be supported through text digitization, virtual classes, and online guidance sessions, allowing students to continue accessing learning even outside the *pesantren* environment. In addition, digital learning platforms can also facilitate independent learning, increase collaboration between students, and assist teachers in monitoring learning activities through a digital learning management system (Sayuti et al., 2024).

In the study of digital religion, digital media also changes the way religious

authorities are produced and distributed in public spaces. The presence of digital platforms allows religious actors, including Islamic boarding schools, to expand religious influence through social media, digital da'wah channels, and online learning platforms (Campbell, 2012; Hoover, 2016). Thus, digitalization affects not only learning methods but also the transformation of religious authority and interaction patterns among the ulama, students, and the community.

However, the findings of this study show that the success of digital transformation in Islamic boarding schools depends not only on the availability of technology but also on the ability of institutions to integrate technological innovation with traditional Islamic boarding school values. Digitalization carried out without considering the cultural context and pedagogy of pesantren has the potential to reduce the depth of the pedagogical relationship between kiai and students, which is at the core of the pesantren education process.

Therefore, the digital transformation of Islamic boarding schools needs to be carried out through a gradual, participatory, and value-based approach. The transformation model that involves the active participation of pesantren caregivers, teachers, and students tends to be more readily accepted by the pesantren community than a technocratic, top-down approach to change. Thus, the digital transformation of Islamic boarding schools is understood not only as a process of technology adoption but also as a process of value negotiation aimed at maintaining a balance between educational innovation and the preservation of Islamic scientific traditions.

Structural Challenges and Cultural Resistance

Islamic boarding schools have traditions and special value systems, such as manners, sincerity, simplicity, independence, and respect for knowledge and kiai (Dhofier, 2011). These values form the students' character and also become the distinctive identity of the pesantren, setting it apart from other modern educational institutions. In the face of technological changes, there are concerns that the traditional values of Islamic boarding schools can be eroded by the rapid growth of modernization and digitalization.

Digital inequality is the main challenge to efforts to transform technology-based education, including in pesantren environments. This inequality reflects significant differences in access, utilization, and understanding of information technology between Islamic boarding schools in urban and rural areas. In the context of Islamic boarding schools, digital inequality not only affects the quality of learning but also the readiness of institutions to face challenges and opportunities in the digital era (Zuraida, 2025).

The digital transformation of Islamic boarding schools faces structural challenges, including limited infrastructure, digital gaps, and low technological competence among educators. In addition, cultural resistance emerged in response to concerns about the loss of traditional Islamic boarding school values.



These findings strengthen the argument that resistance is not just a rejection of technology, but an expression of caution about maintaining the continuity of scientific traditions. Therefore, the approach to digital transformation of Islamic boarding schools must be gradual, participatory, and value-based. These findings show that technological adaptation in Islamic boarding schools does not occur linearly but through a negotiation process among digital innovation, traditional values, and religious authority as the guardian of scientific legitimacy.

CONCLUSION AND SUGGESTION

This article emphasizes that the digital transformation of Islamic boarding schools is a socio-cultural process that involves continuous negotiations between technological innovations, traditional values, and the religious authority of the kiai. Technology adaptation does not occur technocratically but selectively and contextually, as a form of institutional resilience for Islamic boarding schools in the era of digital disruption. These findings show that the success of the digital transformation of Islamic boarding schools is largely determined by the ability to maintain the legitimacy of scientific authorities while integrating technology to strengthen student learning and literacy. This article enriches the study of Islamic education by providing a sociological perspective on the institutional transformation of Islamic boarding schools, while also offering a practical strategic reference for Islamic boarding school managers and policymakers in designing the digitalization of education rooted in Islamic boarding school values.

Based on the findings of this literature review, strategic efforts are needed to develop a contextual, participatory, and value-based digital transformation model for the Islamic boarding school. Islamic boarding school managers are advised to gradually integrate technology by strengthening digital literacy among students and *asatidz*, developing digital-based book learning media that maintain classic methods, and drafting institutional policies that place kiai at the center of scientific authority. On the other hand, the government and Islamic education policymakers are expected to provide support through training, digital infrastructure, and mentoring programs that are sensitive to the characteristics of Islamic boarding school traditions. Thus, digital transformation not only enhances the effectiveness of learning but also strengthens the sustainability of the intellectual tradition of Islamic boarding schools amid the dynamics of technological development.

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