

# Transformation of Pesantren Education Management in the Digital Era

## (Analysis Of Tradition Adaptation Through Educational Innovation Theory)

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### Abstract

Pesantren (Islamic Boarding School) as a traditional Islamic educational institution faces major challenges in navigating changes in the digital era. This study aims to analyze how pesantren transform while maintaining traditional values using the educational innovation theory approach. This research method is qualitative with a literature study approach that utilizes related literature. The results of the study indicate that the transformation of pesantren education management in the digital era includes digitalization of administration, development of online-based learning platforms, and increasing human resource competencies. The application of educational innovation theory is key to supporting the adaptation of tradition to a modern context. This study provides strategic recommendations for pesantren to develop a digital-based management ecosystem that still respects Islamic values.

**Keywords:** Pesantren Management, Digital Era, Educational Innovation, Islamic Tradition, Digitalization

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## INTRODUCTION

Pesantren (Islamic Boarding School), as traditional Islamic educational institutions in Indonesia, face a dual challenge: preserving their deeply rooted Islamic identity while adapting to the rapidly evolving demands of the digital age. This dual role is essential for pesantren to maintain their relevance in the face of significant technological advancements and societal shifts. Incorporating technology into their operations offers potential benefits, such as streamlining administrative processes, enhancing teaching methods, and broadening access to education. However, this transition is often hampered by challenges related to limited infrastructure, insufficient human resources, and a lack of familiarity with modern technologies.

A key obstacle is the need for pesantren to embrace digital literacy and adopt innovative educational practices. Research shows that many pesantren have started integrating digital tools to support both learning and administration, but the scale of adoption varies widely (Rahman & Husin, 2022; Oktaria, 2023). For example, the implementation of *Maktabah Syumilah NU 1.0* software demonstrates how technology can bolster Islamic moderation and improve educational outcomes (Ibda et al., 2023). Yet, the effectiveness of such tools is often undermined by inadequate infrastructure and a shortage of skilled personnel capable of integrating these technologies into teaching and learning processes (Oktaria, 2023; Fadli & Dwiningrum, 2021).

Additionally, the shift toward digital platforms raises concerns about preserving the traditional values that pesantren uphold. Striking a balance between modern educational innovations and the safeguarding of Islamic teachings and moral principles remains a central challenge. Some scholars argue that pesantren should not only prioritize religious education but also equip students with skills relevant to the digital economy. This approach aims to produce *insan kamil*—individuals who are spiritually grounded and technologically competent (Sauri et al., 2022; Kholili, 2021). Such a balanced focus is crucial for preparing students to navigate the complexities of contemporary life while staying firmly rooted in their religious identity.

The role of leadership within pesantren is pivotal in overcoming the challenges of the digital era while preserving their foundational values. Effective leaders are essential for creating an environment that fosters innovation and progress while maintaining respect for traditional Islamic principles. To achieve this, pesantren leaders must proactively address obstacles to technological adoption, such as infrastructure limitations and digital literacy gaps, ensuring their institutions are prepared to meet the evolving demands of the digital age (Kholifah, 2022; Rahman & Asrohah, 2022). Transformational leadership, which promotes adaptability and collaboration, has been shown to significantly enhance the ability of pesantren to thrive in these changing circumstances (Asri, 2022).

In addition to leadership, economic sustainability has become a critical factor in enabling pesantren to innovate and adapt. Many pesantren have initiated entrepreneurial activities, utilizing digital marketing and e-commerce platforms to generate revenue that supports their educational objectives (Kaslam, 2024; Dirawan, 2023). By equipping students with entrepreneurial skills, pesantren can establish self-sustaining financial models that not only ensure economic independence but also provide valuable contributions to the surrounding community (Mustopa et al., 2021; Zahra, 2020). This innovative approach aligns with the broader mission of fostering resilience and adaptability, enabling pesantren to remain relevant and impactful in the face of global challenges.

While pesantren face considerable challenges in preserving their traditional identity amidst the demands of the digital era, they also have significant opportunities to grow and innovate. By integrating technology, improving digital literacy, and cultivating strong and effective leadership, pesantren can successfully overcome these challenges. Combining modern educational approaches with traditional Islamic values ensures that pesantren remain relevant in today's society while reinforcing their position as essential institutions of Islamic education.

This study seeks to address two central questions: (1) How can Islamic boarding schools transform their educational management to align with the demands of the digital age? (2) How can the traditional Islamic values upheld by pesantren be adapted and preserved through the application of educational innovation theory?

## RESEARCH METHODS

This study uses a qualitative method with a literature study approach that utilizes data sources from primary literature, such as scientific journals, textbooks, and research reports related to the transformation of Islamic boarding school education management, as well as secondary literature in the form of scientific articles entitled "*Digitalization of Darul Mustafa Lebak Banten Pesantren*" written by Alip Nur Yanto, Wawan Abdullah and Muammar Zulfiquri. Data analysis techniques are carried out thematically to group findings based on educational innovation theory, allowing researchers to identify relevant transformation patterns in the context of Islamic boarding schools in the digital era.

## RESULTS AND DISCUSSION

### 1. Digital Transformation in Pesantren Management

The management of pesantren has increasingly embraced digital transformation as a vital step toward improving educational efficiency and effectiveness. Key advancements have been made in three main areas: administrative digitalization, the introduction of online learning platforms, and the adoption of data-driven management systems. Despite these significant developments, challenges persist, particularly in rural areas where internet connectivity is limited, and technological literacy among educators remains low, highlighting the need for targeted solutions to bridge these gaps.

#### 1.1. Digitalization of Administration

The integration of software for managing student data, processing online payments, and organizing learning schedules has emerged as a critical step in modernizing the administrative processes of Islamic boarding schools. For instance, the implementation of a website-based student registration system enables prospective students to complete their registration online, significantly streamlining administrative workflows and improving data management (Bismi et al., 2020). Furthermore, digital tools have revolutionized financial management by transitioning from manual to automated processes, thereby enhancing efficiency and ensuring greater transparency in the financial operations of these institutions (Fitri, 2023).

#### 1.2. Development of Online Learning

Many pesantren have adopted Islamic e-learning platforms to provide greater flexibility in the learning process. These platforms allow students to access educational resources at any time and from any location, fostering adaptive and responsive learning experiences that cater to individual needs (Setyaningsih et al., 2019). This approach not only improves access to education but also enables pesantren to extend their reach to students in remote areas who may otherwise be unable to attend in person (Marier et al., 2022). However, implementing e-learning is not without challenges, particularly in rural areas where limited internet connectivity continues to pose significant barriers (Wasyik & Hamid, 2020).

#### 1.3. Data-Driven Management

The adoption of data analytics to assess student performance and learning effectiveness marks a major step forward in the management of education in pesantren. Utilizing data to analyze learning outcomes enables pesantren to pinpoint areas that require improvement and adapt teaching methods to better align with students' needs (Rosyadi,

2024). For example, data analysis can uncover trends in students' learning patterns, allowing educators to refine teaching strategies to boost academic outcomes (Hidayat, 2023). However, a significant challenge lies in the limited technological literacy among educators, which hinders the full potential of data-driven approaches (Setyaningsih et al., 2019).

## **2. Application of Educational Innovation Theory**

Applying educational innovation theory within pesantren is vital to ensure the successful implementation of digital transformation and to maximize its benefits. The theory emphasizes three critical factors that influence the effectiveness of this process: relevance, effectiveness, and user acceptance. Relevance ensures that the adopted innovations align with the unique needs and objectives of pesantren, particularly in preserving Islamic values while modernizing education. Effectiveness focuses on the measurable improvements in educational outcomes and operational efficiency achieved through innovation. Lastly, user acceptance highlights the importance of gaining buy-in from educators, administrators, and students to ensure that new technologies are embraced and effectively utilized. These factors collectively form the foundation for sustainable and impactful digital transformation in pesantren.

### **2.1. Relevance**

For digital transformation to be effective, pesantren must adopt technologies that align with both the needs of students and the principles of Islamic traditions. This alignment ensures that technology is not just a tool but also a means to support educational processes deeply rooted in Islamic values. For example, student data management systems and online learning platforms should be designed to reflect the context of Islamic education, enabling students to engage with content in ways that uphold their religious teachings (Darajah, 2021; Winata et al., 2022). Studies show that pesantren that successfully integrate technology while preserving their traditions are more likely to attract prospective students and maintain their relevance in a rapidly evolving educational landscape (Apriyanto, 2023).

### **2.2. Effectiveness**

The effectiveness of innovations in pesantren lies in their ability to improve educational processes while upholding Islamic values. For instance, Islamic e-learning platforms can enhance the flexibility and accessibility of education but must be carefully designed to align with Islamic principles (Malik, 2023; Apud & Akrom, 2020). Additionally, the use of data analytics to monitor student performance and evaluate learning outcomes enables pesantren to refine their teaching methods continuously. This approach ensures that technological advancements not only support operational efficiency but also contribute to the preservation and enrichment of Islamic education (Kholifah, 2022).

### **2.3. User Acceptance**

Securing the acceptance of kiai, ustaz, and students is vital in successfully implementing technological adaptations in pesantren. Their active involvement in decision-making processes and participation in technology training fosters a sense of ownership and minimizes resistance to change (Indra, 2019; Alim & Syahrul, 2021). Studies reveal that pesantren that engage all stakeholders throughout the innovation process are more likely to achieve successful outcomes when introducing new technologies (Rahman & Asrohah, 2022). Furthermore, as central figures in pesantren, kiai play a pivotal role in filtering and contextualizing the values embedded in technology use, ensuring alignment with Islamic teachings and principles (Sabarudin, 2020).

Although challenges such as limited internet access in rural areas and low technological literacy among educators persist, pesantren that address these barriers through targeted strategies can unlock the opportunities presented by digital transformation. Therefore, the application of educational innovation theory in pesantren

management serves as a strategic approach to safeguarding the sustainability and relevance of Islamic education in Indonesia amidst the evolving demands of the digital era.

### **3. Case Study of Digitalization of Darul Mustafa Pesantren, Lebak, Banten**

Digital transformation is a global trend that has reshaped various sectors, including education, by integrating technology to improve efficiency, accessibility, and quality. In the context of pesantren, this transformation presents a unique opportunity to modernize operations while upholding deeply rooted Islamic values. Pesantren Darul Mustafa, located in Lebak, Banten, exemplifies this progressive adaptation by implementing a range of digital systems to enhance its educational and administrative processes.

Key initiatives at Pesantren Darul Mustafa include online student registration, digital fee payment systems, attendance monitoring through app-based platforms, digital examination assessments, and technology-driven general information services. These efforts have allowed the pesantren to create an adaptive and responsive educational environment that meets contemporary needs while maintaining its commitment to Islamic principles. The following analysis highlights the outcomes and insights derived from the digital transformation at Pesantren Darul Mustafa, offering an inspiring model for other Islamic educational institutions navigating similar transitions.

#### **3.1. Digitalization of Management System**

Pesantren Darul Mustafa has embraced information technology to enhance the efficiency of its educational management through a comprehensive digitalization of administrative systems. A notable initiative is the adoption of Google Forms for new student registration, enabling prospective students to complete the registration process online without requiring physical attendance. This approach centralizes registration data, reducing the risk of data loss and broadening access for prospective students from diverse geographical areas. Moreover, the pesantren has implemented the Junio Smart application for monthly fee payments, which sends automatic notifications to guardians, ensuring timely payments while improving financial accuracy and transparency in managing institutional finances.

These innovations mark critical initial steps in the digitalization of pesantren administration. Online registration and digital fee payment systems have streamlined processes, allowing students and their families to complete essential tasks remotely, thereby saving time and increasing administrative efficiency (Muhith, 2023). In addition, the integration of app-based attendance tracking systems has further enhanced operational efficiency by providing accurate and transparent records of student attendance. This system not only supports disciplinary efforts but also strengthens accountability among students (Muhith, 2023). Through these efforts, Pesantren Darul Mustafa has set a precedent for how digital tools can be effectively utilized to modernize Islamic educational institutions while maintaining their foundational values.

#### **3.2. Transformation of the Learning Process**

Digital transformation is also applied to the learning process to enhance academic effectiveness. Pesantren Darul Mustafa uses the Moodle platform for digital exam assessments, allowing students to access exam questions, upload answers, and receive evaluation results quickly and transparently. Additionally, the SIPOND app is used to provide general information services such as class schedules, attendance reports, and pesantren activities. This app not only facilitates access to information for students and their guardians but also improves internal communication efficiency, strengthening the involvement of guardians in supporting their children's education. This digital transformation reflects Pesantren Darul Mustafa's commitment to providing modern educational services while staying aligned with Islamic values.

The system not only simplifies exam management but also provides faster feedback to students and teachers regarding learning outcomes (Wahyuni, 2023). Consequently, the pesantren can continuously improve the quality of education provided, in line with the demands of an increasingly digital age (Kholili, 2021).

The acceptance of technology by kiai, ustaz, and students at Pesantren Darul Mustafa is critical to the success of this digital transformation. Involving all stakeholders in the technology adaptation process ensures that everyone feels ownership and contributes to the changes occurring (Deni, 2024; Mutmainah, 2024). Kiai, as leaders, play a central role in guiding and motivating students to use technology in their learning, fostering a more inclusive and adaptive learning culture (Tamam, 2024).

### 3.3. Model of Successful Digital Transformation

The success of digitalization at Pesantren Darul Mustafa can be analyzed through four main factors:

Success Factor	Strategy	Outcome
Needs Identification	Identify aspects that most require digitalization (e.g., registration and payment)	Focus on addressing priority needs relevant to the pesantren
Technology Selection	Use user-friendly platforms such as Google Forms and Junio Smart	Accessible technology accelerates user adoption
Training and Support	Involve training for staff and students on digital literacy	Improved human resource competence within the pesantren
Periodic Evaluation	Regularly assess the effectiveness of each digital system	Identifying shortcomings and continuous improvements

This model highlights the importance of focusing on specific needs, selecting appropriate technologies, providing training, and conducting regular evaluations to ensure the sustainability and success of digital transformation in pesantren.

### 3.4. Implementation Challenges

Despite showing success in digitalization, Pesantren Darul Mustafa faces several significant challenges in its implementation. One of the main obstacles is the limited infrastructure, particularly unstable internet access in rural areas, which hampers the smooth operation of the digital systems. Low technological literacy among educators and staff at the pesantren also poses a challenge, as not everyone has adequate competency in using technology. Additionally, the implementation costs, including the procurement of hardware, software, and training, require a substantial initial investment.

To overcome these challenges, the pesantren can collaborate with technology partners and the government to improve network access, organize ongoing training to enhance digital literacy, and explore support from government bodies, donors, or collaborations with technology institutions to assist with funding. Furthermore, the pesantren needs to conduct training and capacity development for educators so they can effectively use technology in the learning process (Darajat et al., 2022; Fitri, 2023). Additionally, improving technological infrastructure in rural areas is essential to ensure that all students can access the necessary educational resources (Alqudsi, 2024).

The digital transformation carried out by Pesantren Darul Mustafa in Lebak, Banten, serves as an inspiring model for other Islamic educational institutions. The implementation of technologies such as online registration, digital payments, app-based attendance, and online exams has enhanced the efficiency and quality of educational management.

However, this success is not without challenges that require strategic solutions, such as improving infrastructure and training human resources.

Pesantren Darul Mustafa has demonstrated that digitalization is not just a trend but also a necessity for survival and growth in the modern era. With careful planning and effective implementation, the pesantren can leverage technology to support a more inclusive and competitive Islamic education.

## CONCLUSION

The transformation of pesantren education management in the digital era has become an urgent priority to maintain the relevance and quality of Islamic education amid rapid technological advancements. Digitalization offers pesantren opportunities to improve administrative efficiency, broaden access to education, and adopt modern, interactive learning methods. Within this framework, the theory of educational innovation provides a structured approach to integrating technology into pesantren traditions, ensuring that core Islamic values are preserved. The success of this transformation is contingent upon collaboration among pesantren, government bodies, and the technology sector to create an educational ecosystem that is both competitive and deeply rooted in tradition.

Achieving this transformation requires a focus on three critical strategies. First, providing targeted technology training for kiai and educators to enhance their digital literacy and enable them to effectively utilize technological tools in their teaching and management roles. Second, improving infrastructure by ensuring reliable internet access and equipping pesantren, particularly in rural areas, with adequate technological resources. Third, forging partnerships with local technology providers to develop solutions tailored to the unique needs of pesantren, such as applications designed to align with Islamic values. By implementing these steps, the digitalization of pesantren can be carried out more efficiently, offering profound benefits for the advancement of Islamic education in Indonesia.

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