

## Digital Transformation and *Pesantren* Values: Rethinking Multidimensional Education in the Era of Globalization

Muhammad Zaki Maulana\*, Umar Manshur, Suhermanto

Universitas Nurul Jadid, Indonesia

Email : [maulanazakz@gmail.com](mailto:maulanazakz@gmail.com)

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### ABSTRACT

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#### \*Corresponding Author

The rapid advancement of information technology has created both opportunities and challenges for Islamic educational institutions, particularly *pesantren*, which must respond to digital transformation while preserving their religious, cultural, and educational values. This study examines the integration of *pesantren* values and information technology at *Pondok Pesantren Nurul Jadid* and explores its implications for the development of multidimensional Islamic education. Employing a qualitative case study design, the study collected data through observations, in-depth interviews, and documentary analysis involving *pesantren* administrators, *wali asuh*, santri, students, and educational institutions involved in technology-based educational development. The findings indicate that information technology has contributed to increased learning interactivity, greater administrative efficiency, broader access to educational materials, and faster communication within the *pesantren* community. However, the implementation of technology remains constrained by unstable internet connectivity, unequal access to technological resources, limited staff training, and differences in technology acceptance among stakeholders. The findings further demonstrate that successful digital transformation in *pesantren* requires more than technological infrastructure; it depends on institutional leadership, human-resource development, supportive policies, and the ability to align technological innovation with established *pesantren* values. The experience of *Pondok Pesantren Nurul Jadid* offers broader insights into how Islamic educational institutions can navigate digital transformation and develop educational models that are locally grounded and responsive to global educational demands.

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## INTRODUCTION

*Pesantren*, as one of the oldest Islamic educational institutions in Indonesia, is currently positioned at a critical intersection between longstanding religious traditions, globalization, and rapid technological development (Ansori et al., 2024; Bakar et al., 2020). The digital revolution has transformed various dimensions of social life, including education, which increasingly relies on information technology to expand access, improve educational quality, enhance institutional efficiency, and accelerate innovation. In this context, *pesantren* cannot disregard technological developments if they are to remain relevant within a rapidly changing global educational landscape. Nevertheless, technological adoption within *pesantren* presents a particular challenge because educational transformation must be pursued without undermining the religious, cultural, and ethical values that constitute the institution's distinctive identity (Ardillah, 2019; Nurkhin et al., 2024). Failure to respond adequately to technological developments may place *pesantren* at risk of falling behind, particularly in providing multidimensional education that combines local values with globally

relevant knowledge and competencies. Therefore, examining the integration of *pesantren* values and information technology is increasingly important for developing an adaptive and sustainable educational approach in the era of globalization.

Previous studies have examined technological transformation in Islamic education, including its application within *pesantren*. The potential of digitalization to improve management systems and teaching practices in *pesantren* (Fitri, 2022; Nursetialloh, 2023). Technological adaptation is frequently constrained by limited resources and resistance to institutional change (Otaya et al., 2023; Toshmali et al., 2020). Although these studies provide important insights into the opportunities and challenges associated with technological adoption, much of the existing discussion tends to emphasize the technical and managerial dimensions of technology implementation. Less attention has been given to the question of how *pesantren* values can be systematically and harmoniously integrated with information technology while preserving the institution's religious and cultural foundations. This gap is particularly significant because technological transformation in *pesantren* cannot be understood solely as a process of technological adoption; rather, it involves negotiating between technological innovation, institutional identity, educational objectives, and deeply embedded religious values. Addressing this gap provides an opportunity to develop an integrative perspective that considers both technological transformation and the preservation of *pesantren* values in responding to the demands of modern and global education.

Against this background, this study addresses three fundamental questions: (1) How can *pesantren*, particularly *Pondok Pesantren Nurul Jadid*, integrate its traditional values with information technology to support multidimensional education? (2) What challenges and opportunities emerge from this process of integration? and (3) How can such integration contribute to addressing contemporary educational issues, particularly global relevance and character development? By focusing on *Pondok Pesantren Nurul Jadid* as a case study, this study seeks to formulate a strategic approach through which *pesantren* can respond to the demands of globalization and technological change while maintaining their institutional identity. The study is therefore expected to provide both conceptual and practical insights for *pesantren* seeking to navigate the increasing complexity of contemporary education.

The central proposition of this study is that the integration of *pesantren* values and information technology, as demonstrated through the practices of *Pondok Pesantren Nurul Jadid*, can provide an effective approach to developing multidimensional education that is simultaneously locally grounded and globally relevant. When appropriately implemented, information technology has the potential to expand learning opportunities, improve administrative efficiency, and facilitate broader forms of academic and international collaboration. However, the effectiveness of technological integration depends on an approach that remains sensitive to the religious, ethical, and cultural values embedded within *pesantren* education. Technological transformation should therefore function not as a replacement for traditional educational values but as a means of strengthening their relevance within contemporary educational contexts. Accordingly, this study contributes to the growing discussion on Islamic education in the digital era by examining the relationship between *pesantren* values and technological transformation and by providing insights that may inform the development of value-based educational policies and practices.

## RESEARCH METHOD

### *Research Design and Unit of Analysis*

This study employed a qualitative research approach using a case study design to examine the integration of *pesantren* values and information technology at *Pondok Pesantren Nurul Jadid*. A qualitative approach was selected because the study seeks to explore in depth the experiences,

perspectives, practices, and institutional dynamics associated with the integration of technology within a *pesantren* context. The case study design enables an in-depth examination of a contemporary phenomenon within its real-life setting, particularly the ways in which technological transformation interacts with the religious, cultural, and educational values embedded in *pesantren* institutions.

The unit of analysis was *Pondok Pesantren* Nurul Jadid, an Islamic educational institution that has been implementing information technology in various aspects of its daily activities. The study focused on how traditional *pesantren* values are integrated with technological developments and how this integration influences the delivery and quality of education. *Pondok Pesantren* Nurul Jadid was selected as the case because it represents a *pesantren* that is undergoing educational and institutional transformation while seeking to maintain its traditional religious and cultural foundations. The implementation of information technology in the *pesantren* provides a relevant context for examining its potential contribution to learning effectiveness, communication among students, and institutional administration.

### ***Participants and Sources of Data***

The primary sources of data were individuals directly involved in educational and institutional activities at *Pondok Pesantren* Nurul Jadid. Participants included caregivers (*wali asuh*) responsible for supervising and mentoring students, *pesantren* administrators involved in institutional policy and technology implementation, and students who use technology in their learning and daily educational activities. Educational units and institutions involved in developing and facilitating technology-based curricula were also considered important sources of information.

The selection of participants was based on their direct involvement and relevant experience in the implementation and use of information technology within the *pesantren*. By incorporating perspectives from administrators, caregivers, students, and educational institutions, the study sought to obtain a comprehensive understanding of the opportunities, challenges, and implications associated with integrating technology into *pesantren* education.

### ***Data Collection***

Data were collected through three complementary techniques: observation, in-depth interviews, and documentation. These techniques were used to obtain information from different sources and to develop a comprehensive understanding of the phenomenon under investigation.

Observation was conducted to examine directly how information technology is implemented and utilized within *Pondok Pesantren* Nurul Jadid. Particular attention was given to the use of technology in teaching and learning activities, *pesantren* administration, and communication among students and other members of the educational community. Observation enabled the researchers to examine actual practices and institutional processes rather than relying solely on participants' accounts.

In-depth interviews were conducted with *pesantren* administrators, *wali asuh*, and selected students. The interviews explored participants' perceptions and experiences regarding technological adoption, changes in educational practices, the relationship between technology and *pesantren* values, and the challenges and opportunities emerging from the integration process. The use of multiple participant groups enabled the study to capture different perspectives on the same phenomenon.

Documentary data were also examined to complement the observational and interview data. Relevant documents included *pesantren* activity reports, institutional policies, educational materials, and documents related to the implementation and use of information technology. The integration of observational, interview, and documentary evidence was intended to strengthen the completeness and credibility of the findings.

## **Data Analysis**

The collected data were analyzed through a systematic process consisting of data reduction, data display, and conclusion verification. During the data reduction stage, the researchers identified, selected, organized, and condensed information that was relevant to the research questions while excluding data that did not directly contribute to the analytical focus. This process enabled the researchers to identify significant patterns and recurring issues related to the integration of *pesantren* values and information technology.

The reduced data were subsequently organized and displayed in narrative and, where appropriate, tabular forms to facilitate the identification of patterns, relationships, and emerging themes. The final stage involved verification and interpretation of the findings by examining the consistency of the identified patterns across different data sources.

To deepen the analysis, the study employed content analysis, discourse analysis, and interpretive analysis. Content analysis was used to identify recurring themes and patterns within interview transcripts, observations, and documentary materials. Discourse analysis was used to examine how information technology, modernization, educational transformation, and *pesantren* values were articulated within the institutional context. Interpretive analysis was then employed to explore the underlying meanings and significance of the observed practices and participants' perspectives. The combination of these analytical approaches enabled the study to develop a comprehensive interpretation of how information technology is integrated into *pesantren* education while maintaining its traditional educational values.

## **RESULTS AND DISCUSSION**

### **The Integration of Information Technology Concept**

The interview findings indicate that the integration of information technology at *Pondok Pesantren Nurul Jadid* has received generally positive responses from administrators and students, although its implementation continues to face several institutional and infrastructural challenges. The interview data were obtained from *pesantren* administrators, *wali asuh* (student caregivers), santri, and students. The responses reveal differences in the level of technology acceptance across groups, reflecting their respective roles, experiences, and orientations toward technological change.

Overall, *pesantren* administrators and students demonstrated relatively high levels of acceptance of information technology. Administrators particularly emphasized the contribution of technology to improving administrative efficiency, data management, and institutional communication. Students also perceived technology positively because it provided broader and more flexible access to learning materials. These findings suggest that technology is increasingly perceived not merely as an additional educational instrument but as a mechanism that can support both academic and institutional processes.

However, the interviews also identified several barriers to effective implementation. Limited training and unstable internet connectivity were repeatedly identified as important constraints. The lack of adequate training may limit the capacity of staff to utilize available technological systems effectively, while unstable connectivity reduces the continuity and effectiveness of technology-supported learning and communication.

The responses from *wali asuh* indicated a comparatively lower level of acceptance. Their concerns were associated primarily with the potential implications of technological change for established traditions and practices within the *pesantren* environment. This finding illustrates that technology adoption is not solely a technical process but also involves institutional and cultural considerations. For actors who are closely connected to traditional *pesantren* values, technological

transformation may generate concerns regarding changes in established patterns of supervision, interaction, and education.

The relatively higher acceptance among santri and students further indicates a generational dimension in technology adoption. Younger members of the educational community tend to be more familiar with digital technologies and therefore appear more receptive to their use as learning and communication tools. Nevertheless, positive attitudes alone do not guarantee successful implementation. The findings indicate that technology acceptance needs to be accompanied by adequate infrastructure, institutional support, and continuous capacity development.

Taken together, the interview findings reveal a gap between the perceived benefits of technology and the conditions required for its effective implementation. Technology is widely recognized as beneficial, particularly for improving administrative efficiency and expanding access to educational resources. However, differences in technological competence, attitudes toward institutional change, training opportunities, and infrastructure continue to influence the effectiveness of implementation. This suggests that the integration of technology within *pesantren* requires a balanced approach that accommodates technological innovation while remaining sensitive to established institutional and religious values.

### Technology Use

The observational findings provide further evidence that information technology has become integrated into several dimensions of daily activities at *Pondok Pesantren* Nurul Jadid. Three main areas were identified: teaching and learning, *pesantren* administration, and communication among members of the *pesantren* community.

**Table 1. Technology Use**

| Observed Area                   | Technology Use                | Challenges Identified         | Positive Impacts                      |
|---------------------------------|-------------------------------|-------------------------------|---------------------------------------|
| Teaching and Learning           | Use of projectors and tablets | Limited internet connectivity | Increased learning interactivity      |
| <i>Pesantren</i> Administration | Administrative applications   | Limited staff training        | Greater efficiency in data management |
| Student Communication           | WhatsApp groups and email     | Unequal access among students | Faster and easier communication       |

Table 1, in teaching and learning activities, digital devices such as projectors and tablets were observed to support the presentation and delivery of learning materials. The use of these technologies contributed to greater interactivity in the classroom. However, unstable internet connectivity remained a constraint, particularly for activities requiring continuous online access.

In *pesantren* administration, technology was used through administrative applications to facilitate data management and institutional processes. The observation indicated that digital administrative systems contributed to greater efficiency in managing institutional data. Nevertheless, difficulties related to staff training limited the extent to which these systems could be utilized optimally. This finding reinforces the importance of human capacity as a critical component of technological transformation.

Technology was also observed in communication practices among students and *pesantren* administrators. WhatsApp groups and email facilitated faster and more convenient communication. However, unequal access to technological devices meant that not all students could benefit from these communication channels to the same extent. This condition indicates the existence of a digital access gap within the *pesantren* environment.

The observational findings demonstrate that technology has generated tangible benefits for both educational and administrative activities. Increased classroom interactivity, more efficient data management, and faster communication represent important contributions of technological integration. At the same time, infrastructure limitations, unequal access, and insufficient staff training constrain the effectiveness and inclusiveness of the transformation.

The pattern emerging from the observations suggests that the success of technological integration depends not only on the availability of digital tools but also on the supporting ecosystem in which those tools are implemented. Infrastructure, human resources, digital access, and institutional readiness must develop together. Consequently, technological transformation in *pesantren* should be understood as an institutional process rather than simply the introduction of new technological devices or applications.

### Implementation of The Integration Technology

Documentary evidence further confirms that *Pondok Pesantren Nurul Jadid* has undertaken systematic efforts to integrate information technology into its educational and administrative policies. The available documentation indicates that technology adoption has been incorporated into both administrative management and digital learning.

**Table 2. Implementation of The Integration Technology**

| Policy                               | Implementation Date | Outcomes                                                 | Challenges                     |
|--------------------------------------|---------------------|----------------------------------------------------------|--------------------------------|
| Administrative System Implementation | January 2023        | Improved efficiency in data management and communication | Limited staff training         |
| Digital Learning through Platforms   | March 2023          | Broader and more flexible access to learning materials   | Unstable internet connectivity |

Table 2, the implementation of the administrative system in January 2023 demonstrates an institutional effort to improve the efficiency of data management and communication. The documented outcomes indicate that the use of a digital administrative system contributed to more efficient institutional processes. However, limited staff training remained an important constraint on the optimal utilization of the system.

Similarly, the implementation of digital learning platforms in March 2023 expanded students' access to learning materials and provided greater flexibility in the learning process. Nevertheless, unstable internet connectivity continued to affect the effectiveness of digital learning implementation.

The documentary findings therefore indicate that the integration of technology at *Pondok Pesantren Nurul Jadid* has been supported by explicit institutional policies rather than occurring solely through informal or individual initiatives. This represents an important characteristic of sustainable technological transformation because institutional policies provide a basis for integrating technology into routine educational and administrative practices.

At the same time, the documentary evidence reveals a discrepancy between policy implementation and the resources available to support it. Although the policies demonstrate institutional commitment to digital transformation, limitations in staff training and technological infrastructure remain significant challenges. This finding suggests that the effectiveness of technology-related policies depends on the availability of complementary resources, particularly human-resource capacity and infrastructure.

## Toward Value-Sensitive Digital Transformation

The integration of findings from interviews, observations, and documentary analysis reveals three interconnected dimensions of technological transformation at *Pondok Pesantren* Nurul Jadid: technology acceptance, institutional capacity, and value-sensitive adaptation.

First, technology acceptance among administrators, santri, and students indicates that information technology is increasingly viewed as compatible with contemporary educational needs. Its perceived benefits include improved administrative efficiency, enhanced learning interactivity, expanded access to learning materials, and faster communication. However, acceptance is not uniform across all groups. The comparatively lower acceptance among *wali asuh* demonstrates that technological transformation may generate concerns when it is perceived as challenging established traditions and institutional practices.

Second, institutional capacity constitutes a major determinant of successful implementation. The findings consistently identify limited staff training and unstable internet connectivity as significant barriers across the three sources of evidence. The convergence of interview, observation, and documentary findings strengthens the interpretation that technological transformation cannot be sustained through technological investment alone. Human-resource development and infrastructure improvement are equally important for ensuring effective implementation.

Third, the findings demonstrate that technological transformation within *pesantren* is closely connected to the preservation and adaptation of institutional values. The concern expressed by *wali asuh* regarding traditional practices indicates that the introduction of technology must be managed in a manner that respects the distinctive educational and cultural characteristics of *pesantren*. In this context, technology should not be positioned as a replacement for traditional *pesantren* values but as a supporting mechanism through which these values can remain relevant within contemporary educational environments.

The case of *Pondok Pesantren* Nurul Jadid therefore illustrates a form of digital transformation characterized by both adaptation and continuity. On the one hand, technology provides opportunities to improve educational and administrative processes. On the other hand, the transformation requires institutional negotiation to ensure that technological innovation remains compatible with the *pesantren's* established educational orientation. The findings consequently suggest that a successful model of digital transformation in *pesantren* should integrate technological innovation, institutional capacity building, equitable access, and the preservation of core educational values.

From this perspective, the integration of information technology should be understood as a multidimensional process. Its effectiveness cannot be assessed solely through the availability or frequency of technology use but must also be considered in terms of educational benefits, institutional efficiency, accessibility, human-resource readiness, and compatibility with *pesantren* values. The experience of *Pondok Pesantren* Nurul Jadid demonstrates that *pesantren* can respond to digital transformation while maintaining their institutional identity, provided that technological adoption is accompanied by appropriate capacity development, infrastructure improvement, and value-sensitive institutional management.

## Discussion

The findings demonstrate that the successful integration of information technology into *pesantren* education depends not only on the availability of technological resources but also on leadership, human-resource capacity, institutional culture, and the ability to manage organizational change. The interview findings indicate that *pesantren* administrators and students generally perceive technology positively because of its contribution to administrative efficiency, learning experiences,

communication, and access to educational resources (Akbar et al., 2025; Handoyo et al., 2021; Nisa' et al., 2024). However, the comparatively lower acceptance among *wali asuh* indicates that technological transformation may generate concerns when it is perceived as potentially altering established educational practices and traditional values.

One of the most important implications of the findings is the role of institutional leadership in facilitating technological transformation. Positive attitudes among *pesantren* administrators suggest that leadership can influence how technology is understood and adopted within the institution. When technological innovation is clearly associated with improvements in administrative efficiency and educational quality, institutional actors are more likely to perceive it as a means of strengthening existing educational practices rather than replacing them.

Nevertheless, the variation in technology acceptance among stakeholders indicates that leadership commitment alone is insufficient. The concerns expressed by *wali asuh* demonstrate the importance of participatory engagement and targeted capacity development. Resistance to technological change should not necessarily be interpreted as a rejection of technology itself. Rather, it may reflect concerns about the compatibility between technological innovation and established pedagogical, cultural, and religious practices. Therefore, technology integration in *pesantren* requires leadership that can mediate between innovation and institutional continuity.

Training consequently represents a critical component of the integration process. The lack of adequate training identified in the interviews, observations, and documentary evidence suggests that the effectiveness of technological systems is strongly dependent on users' ability and confidence to operate them (Abdurrahman et al., 2025; Anwar et al., 2024). Continuous professional development should therefore be designed not only to improve technical competence but also to demonstrate how technology can be aligned with the educational objectives and values of *pesantren*. Such an approach may reduce resistance by positioning technology as a supportive instrument rather than a disruptive force.

The observational findings further demonstrate that the benefits of technological integration are closely related to the availability and reliability of infrastructure. The use of digital devices in classrooms, administrative applications, and digital communication platforms has improved interactivity, administrative efficiency, and communication. However, unstable internet connectivity and unequal access to technological devices continue to limit the effectiveness of these innovations.

This finding highlights an important distinction between technology availability and meaningful technology utilization. The presence of digital platforms or devices does not automatically produce educational transformation. Their impact depends on whether users have reliable connectivity, sufficient access to devices, and the competencies required to use them effectively. In the context of *Pondok Pesantren Nurul Jadid*, the observed digital access gap may create unequal opportunities among students if technological resources are not distributed equitably.

The relationship between infrastructure and educational effectiveness therefore represents a central issue in the digital transformation of *pesantren*. Improvements in technological infrastructure need to be accompanied by investment in human resources and institutional support (Fitria et al., 2025; Ugwu et al., 2024). Without such complementary investment, technological adoption may remain fragmented and may not generate its intended educational benefits. The findings consequently suggest that infrastructure development should be viewed as an integral component of educational transformation rather than as a separate technical concern.

The documentary findings indicate that *Pondok Pesantren Nurul Jadid* has established institutional policies supporting the implementation of technology in administrative and educational activities. The implementation of an administrative system and digital learning platforms

demonstrates that technological adoption has moved beyond individual initiatives toward a more institutionalized form of digital transformation.

However, the findings also show that the existence of formal policies does not automatically ensure successful implementation. Limitations in staff training, infrastructure, and resource allocation continue to affect the effectiveness of policy implementation (Huda et al., 2024; Nwuke, 2024). This suggests that technological policies need to be accompanied by clear implementation mechanisms, adequate resource allocation, capacity development, and periodic evaluation.

A sustainable technology integration strategy therefore requires a dynamic policy framework. Policies should not be treated as fixed directives but should be periodically reviewed and adapted in response to technological developments, institutional conditions, and the needs of the *pesantren* community. Such flexibility is particularly important in religious educational institutions, where technological change must be negotiated within an established system of religious, ethical, and cultural values. A central contribution of this study is the indication that digital transformation in *pesantren* should not be conceptualized as a choice between technological modernization and the preservation of tradition. Rather, the findings suggest that both dimensions can coexist when technology is integrated according to the institutional values and educational mission of the *pesantren*.

The different responses among administrators, *wali asuh*, and students demonstrate that technological transformation involves a process of institutional negotiation. Administrators tend to emphasize efficiency and organizational benefits, students tend to emphasize accessibility and learning convenience, while *wali asuh* are more concerned with the implications of technological change for established educational practices (Karim & Masrukin, 2020; Zahra & Khoiruddin, 2023). These differences indicate that successful integration requires a common institutional understanding of the purpose and boundaries of technology use.

From this perspective, the experience of *Pondok Pesantren Nurul Jadid* illustrates a model of value-sensitive digital transformation, in which technological innovation is pursued while maintaining the educational and cultural foundations of the *pesantren*. Technology functions as an enabling mechanism for improving learning, administration, and communication, while *pesantren* values provide the normative framework within which technological use is defined and managed.

The combined findings have broader implications for the development of multidimensional Islamic education. The integration of technology expands the functions of *pesantren* beyond conventional classroom instruction by supporting administrative management, digital communication, access to learning resources, and potentially broader educational collaboration (Geletu & Mihiretie, 2023; Kazazoglu & Bilir, 2021). At the same time, the preservation of *pesantren* values ensures that technological development remains connected to character formation and the institution's religious educational mission.

The findings therefore suggest that multidimensional education in the digital era requires integration across several dimensions: technological competence, academic development, administrative effectiveness, communication, and character formation. Technology can strengthen these dimensions, but it cannot replace the human and value-based foundations of education. The distinctive contribution of *pesantren* lies precisely in its capacity to combine technological adaptation with an established moral and religious educational framework.

For other Islamic educational institutions, the case of *Pondok Pesantren Nurul Jadid* provides several practical implications. First, institutional leaders need to establish a clear vision of digital transformation that is consistent with the institution's educational values. Second, technological adoption should be accompanied by continuous training and professional development. Third, investment in reliable infrastructure and equitable access should be treated as a strategic priority.

Finally, technology-related policies should be evaluated and adapted continuously to ensure that implementation remains responsive to institutional and educational needs. The findings demonstrate that the effectiveness of technological integration in *pesantren* is determined by the interaction between technological resources, human capacity, institutional leadership, infrastructure, policy, and cultural values. Digital transformation is therefore not simply a process of introducing new technologies but a broader institutional change process.

## CONCLUSION

The integration of *pesantren* values and information technology at *Pondok Pesantren Nurul Jadid* provides a promising approach to strengthening multidimensional Islamic education in the digital era. The findings demonstrate that technology contributes positively to learning interactivity, administrative efficiency, access to educational resources, and communication, while its implementation remains constrained by unstable internet connectivity, unequal access to technological resources, limited staff training, and differences in technology acceptance among stakeholders. These challenges indicate that digital transformation in *pesantren* is not merely a technical process but an institutional and cultural process that requires effective leadership, continuous capacity development, adequate infrastructure, inclusive access, and policies that remain sensitive to *pesantren* values. The experience of *Pondok Pesantren Nurul Jadid* demonstrates that technological innovation and the preservation of traditional Islamic educational values can coexist when technology is positioned as a supporting instrument rather than a replacement for the institution's religious and cultural foundations. Accordingly, value-sensitive digital transformation can provide a sustainable pathway for *pesantren* to enhance educational quality while maintaining their institutional identity and responding to the demands of contemporary and global education.

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