



DIGITAL LEADERSHIP IN PESANTREN: BRIDGING TECHNOLOGICAL AFFORDANCES FOR SUSTAINABLE DISTANCE EDUCATION ECOSYSTEMS

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Abstract: This study aimed to analyze and describe the practices of *Kiai's* digital leadership in implementing distance education in pesantren, particularly in bridging the gap between technological affordances and a sustainable educational ecosystem. The research employed a qualitative approach with a multi-case study design across four pesantren representing different typologies (modern, salaf, and hybrid). Data were collected through in-depth interviews, participant observation, and document analysis. Data analysis was conducted using an semantic analysis, while triangulation was applied through source triangulation to ensure validity. The findings revealed four main digital leadership strategies: role modeling, delegation of authority, normative-restrictive control through religious legitimacy, and incremental-institutional approaches. These strategies demonstrated that the success of distance education in pesantren is highly dependent on the *Kiai's* ability to integrate technology with institutional values and cultural contexts. The study implied that value-based digital leadership plays a crucial role in ensuring sustainable digital transformation in religious educational institutions, offering both theoretical contributions to digital leadership discourse and practical guidance for pesantren management.

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INTRODUCTION

The study's dependent variable, distance education, is a mode of instruction that enables learning to occur without teachers and students being physically present. Distance education in the context of Islamic boarding schools (*pesantren*) includes character development, internalization of Islamic values, and

the practice of etiquette (Habes et al., 2023 and Kholikov, 2025). All of which have historically been characteristics of boarding school-based education in addition to knowledge transfer. Therefore, the ability of Islamic boarding schools to incorporate digital technology into the traditional educational system has a significant impact on the effectiveness of remote learning (Bilqis et al., 2023; Hussam & Liyawu, 2025; Rohman et al., 2023b). The interplay of pedagogical, technological, cultural, and leadership factors makes this variable complicated. A sustainable, flexible learning environment that is in line with the principles of the Islamic boarding school is also necessary for effective distant learning. As a result, the leadership dynamics that direct digital transformation in the context of Islamic boarding schools are inextricably linked to this dependent variable (Hernández-Sabaté et al., 2024; Rohman et al., 2023a; Sailin et al., 2024).

The phenomena seen in the research participants show a substantial disconnect between the environment of Islamic boarding schools' preparedness to adopt distant learning and technology affordances. On the one hand, the advancement of digital technology provides a number of benefits, including time flexibility, a variety of learning tools, and access to online education. Nonetheless, there were still issues with digital literacy, technology infrastructure, and cultural opposition to the usage of digital gadgets at many Islamic boarding schools. When distant learning is enforced as a requirement rather than as a well-thought-out strategic decision, this disparity became even more noticeable. Additionally, there were worries that unrestrained technology use could undermine traditional Islamic boarding school principles, including character development, discipline, and face-to-face interaction. This case illustrated how, despite technology's enormous promise, its use was not always successful in the absence of a suitable plan to close these gaps.

This study suggested a digital leadership approach as a tactical way to close this gap and maximize technology use while preserving the long-term viability of the Islamic boarding school education system. In this sense, "digital leadership" referred to the *Kiai's* capacity to effectively guide, manage, and incorporate technology into the educational system in addition to their aptitude for using it. This method highlighted the significance of the *Kiai's* role as a change agent who can create adaptable regulations, curate technology in accordance with Islamic boarding school ideals, and foster a positive digital culture. Therefore, digital leadership acts as a link between the necessity to preserve the Islamic boarding school's identity and the possibilities of technology. The adaptive-preventive principle, in which technology is used gradually while still anticipating its negative effects, is also given priority in this strategy. This strategy is intended to make distant learning at Islamic boarding schools successful, long-lasting, and grounded in traditional values.

Numerous earlier studies from Ishaq & Dayati (2024); Lahza et al. (2023); Menard et al. (2024); Nabi et al. (2024) have looked at different facets of distance learning and digital leadership, both in the context of general education and religious education. In general, these studies highlight the significance of educational leaders' digital competences in promoting learning transformation,

notably in managing technology, making data-driven decisions, and enhancing teacher capacity. Additionally, additional studies by Hill et al. (2023); Strielkowski et al. (2025); Trevisan et al. (2024) have demonstrated that students' digital literacy and infrastructural preparedness have a major impact on the success of distant learning. However, the majority of this research has not examined the dynamics of digital leadership in the particular setting of Islamic boarding schools (*pesantren*), instead concentrating on the formal school context. Without going into great detail on how *Kiai* (Islamic clerics) leadership techniques might solve these issues, some research on Islamic boarding schools tends to focus on features of traditionalism and resistance to technology. This suggests a research gap that must be addressed in order to gain a more thorough understanding of the connection between digital leadership and the effectiveness of remote learning in Islamic boarding schools.

Finding a leadership paradigm that can handle the difficulties of digital transition in Islamic boarding schools (*pesantren*) without losing their identity is what makes this research so vital. Islamic boarding schools cannot fully escape the use of technology in the rapidly changing digital age, particularly in circumstances that call for flexible learning, like distant learning. Undirected technology use, however, has the potential to upend established educational systems. Thus, a strategy that is focused on both the preservation of Islamic boarding school culture and principles as well as technical innovation is required. This study is distinctive because it focuses on Islamic boarding schools' (*kyai*) digital leadership practices as key players in closing the gap between the educational ecosystem and technological prospects. Compared to earlier studies that have only concentrated on technical or policy concerns, this research gives an alternative viewpoint by focusing on Islamic boarding schools (*Kiai*).

Based on this explanation, the goal of this study was to examine and characterize the digital leadership strategies used by Islamic boarding schools (*Kiai*) in the implementation of distance learning, with a focus on bridging the gap between technological affordances and a sustainable educational ecosystem. The primary tactics employed by Islamic boarding schools (*Kiai*), their functions in the process of digital transformation, and the leadership typologies developed within the framework of each Islamic boarding school are the main objectives of this study. This study also seeks to understand how Islamic boarding school ideals are upheld in the face of an increasingly powerful digitalization trend. It is anticipated that this study would offer a thorough summary of the dynamics of digital leadership in Islamic boarding schools, while also offering a model that can be replicated or further developed in different contexts.

RESEARCH METHOD

This research used a qualitative, multi-site approach, comparing several Islamic boarding schools (*pesantren*). This research can produce more transferable findings and demonstrate variations in practice based on context. The sites for this study were selected by purposive and snowball sampling, with four Islamic boarding schools in Java and Sumatra. The criteria were that they

had implemented distance learning for at least two years after the pandemic and had varied typologies (salaf, modern, and combination). Data were collected using three key instruments: in-depth interviews, non-participant observation with ethnographic notes, and a review of relevant documentation. Interviews used semi-structured questions with the Kiai (leader) of each Islamic boarding school, program managers, three teachers, and three students, for a total of 32 informants. Document analysis included data from the Islamic boarding schools' written policies regarding online learning, online curriculum and teaching materials, platform usage records, and other online learning archives.

The collected data was analyzed semantically, involving five stages: Stage 1: Data Familiarization (Re-reading transcripts, noting initial ideas). Stage 2: Initial coding (Coding data segments relevant to the research questions). Stage 3: Theme search (Grouping codes into potential themes). Stage 4: Theme review (Checking whether the themes are consistent with the data and theoretical framework). Stage 5: Defining and naming themes (Formulating the essence of each theme). Stage 6: Report writing (Compiling a narrative of findings) (Ragin, 2024 and Tracy, 2024). This type of research also requires cross-case analysis found in each object to be compared between themes between Islamic boarding schools, identifying common patterns as well as unique contexts. Then the data findings are validated using source triangulation techniques.

RESULT AND DISCUSSION

Result

The effectiveness of digital change depended on the *kyai's* role as the ultimate leader, as all of the Islamic boarding schools under investigation showed. Instead of just giving up their traditional authority, *Kiai* used it to justify the use of technology. However, the tactics used differ based on the features of each Islamic boarding school.

Table 1. *Kyai's* Digital Leadership Strategy in Four Islamic Boarding Schools

Object	Typology	The Main Strategy	The Role of <i>Kyai</i>	Unique
Al-Hikmah	Modern	<i>Role Modeling</i>	Direct role model	Kyai becomes the first user, reducing resistance
Nurul Iman	Combination	Delegation of Authority	Value and policy monitor	Independent IT team but bound by the Kiai's vision
Darussalam	<i>Salaf</i>	Fatwas & Strict Control	Religious legitimizer	Fatwa as a legal basis, mandatory regular physical presence
Al-Falah	Modern	Incremental &	Written policy	Own application

Object	Typology	The Main Strategy	The Role of Kyai	Unique
		Institutional	driver	development, dedicated budget

The table illustrating the diversity of digital leadership tactics used by *Pesantren* shows notable variations in methodology, necessitating further investigation to determine each's efficacy in overcoming the technology divide. The several *pesantren* typologies (modern, *salaf*, and hybrid) also imply that the institutional framework has a significant impact on the type and course of digital leadership. Furthermore, the *Kiai*'s varied responsibilities, from serving as policy makers and role models to offering religious legitimacy through *fatwas*, reflect a degree of leadership complexity that is impossible to fully comprehend without a thorough examination. Each *pesantren*'s distinct tactics, including the creation of stand-alone applications and stringent value-based control, further demonstrate the presence of local innovations that hold potential as alternative models for distance education. Therefore, a more in-depth discussion is essential to identify general patterns as well as the distinctive characteristics of each strategy in supporting a sustainable educational ecosystem.

Islamic Boarding School Al-Hikmah (Modern Typology: Role Modeling)

The *Kiai*, or Islamic scholars, are the main players in the utilization of distant learning technology at Al-Hikmah Islamic Boarding School's digital leadership strategy, which is focused on role modeling. Additionally, this method showed how to continuously adapt to new technology advancements. It also shows how the *pesantren* environment's constant leadership and support are crucial to the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. According to interviews, the *Kiai*'s early adoption of technology marked a paradigm shift in digital adaptation. This further illustrated how the *pesantren* environment's constant leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

Internal documents showed a cultural attitude to technology use without strict rules. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. This further illustrates how the *pesantren* environment's constant leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. This strategy used the *Kiai* as a change agent and reflects a contemporary, adaptable *pesantren*. This approach also exemplified an ongoing process of adaptation in response to advancements in technology. This further shows that the Islamic boarding school environment's steady leadership and support play a major role

in the strategy's success. As a result, putting this technique into practice involved cultural and pedagogical considerations in addition to technological ones.

Islamic Boarding School Nurul Iman (Combination Typology)

By creating a specialized IT staff, Nurul Iman Islamic Boarding School employs a delegation model. Additionally, this method showed how to continuously adapt to new technology advancements. This further showed that the Islamic boarding school environment's steady leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. According to interviews, the IT staff was free to experiment while still adhering to the Kiai's principles. It also showed that the *pesantren* environment's steady leadership and support had a big impact on the strategy's success. As a result, this strategy's execution involved cultural and pedagogical considerations in addition to technological ones.

Semi-formal norms for technology use were found in documents. Additionally, this method showed how to continuously adapt to new technology advancements. It also showed that the *pesantren* environment's steady leadership and support had a big impact on the strategy's success. As a result, this strategy's execution involved cultural and pedagogical considerations in addition to technological ones. The blending of traditional and modern leadership is reflected in the combined type. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. It also shows how the Islamic boarding school environment's steady leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

Islamic Boarding School in Darussalam (Salaf Typology)

Fatwas and stringent technology usage regulations were the methods used by Darussalam Islamic Boarding School. This approach also exemplified an ongoing process of adaptation in response to advancements in technology. This further indicates that the Islamic boarding school environment's steady leadership and support have a significant impact on the strategy's effectiveness. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. According to interviews, every technical advancement needs to be evaluated in light of Islamic law. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. It also showed how the Islamic boarding school environment's steady leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

The usage of digital gadgets is subject to stringent limitations, according to documents. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. This further indicates that the

Islamic boarding school environment's steady leadership and support have a significant impact on the strategy's effectiveness. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. This strategy shows how traditional Islamic boarding schools, or *pesantren*, adapt to innovation in a selective manner. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. It also showed how the *pesantren* environment's constant leadership and support are crucial to the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

Islamic Boarding School Al-Falah (Modern Typology)

Al-Falah Islamic Boarding School created institutional and incremental strategies. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. This further illustrates how the *pesantren* environment's constant leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. Interviews reveal the Kiai's function as a catalyst for technological policy. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. This further illustrates how the *pesantren* environment's constant leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

Standard operating procedures (SOPs) for online learning are documented. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. This further illustrates how the *pesantren* environment's constant leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. The institution's systematic integration of technology is reflected in this strategy. This approach also exemplifies an ongoing process of adaptation in response to advancements in technology. This further illustrates how the *pesantren* environment's constant leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

Comparative Evaluation

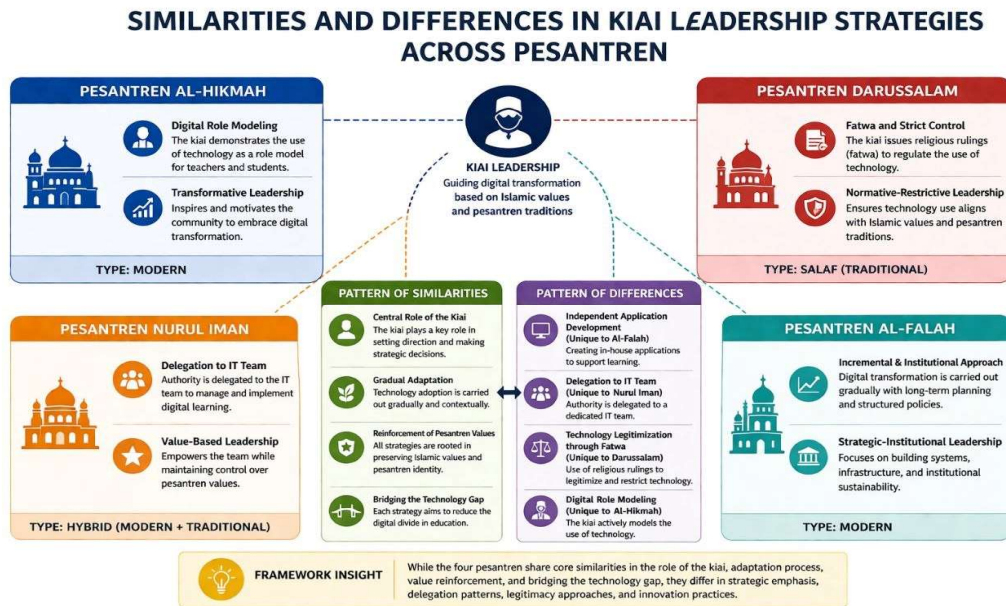


Figure 1. Similarities and Differences in Kiai Leadership Strategies Across Pesantren

The placement of the Kiai (Islamic cleric) as a key player is a commonality among the four *pesantren*. Additionally, this method shows how to continuously adapt to new technology advancements. It also shows how the Islamic boarding school environment's steady leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. All Islamic boarding schools are gradually implementing digital revolution. Additionally, this method shows how to continuously adapt to new technology advancements. It also shows how the Islamic boarding school environment's steady leadership and support play a major role in the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

The degree of openness to technology varies. It also showed that the Islamic boarding school environment's consistent leadership and support have a significant impact on the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones. Digital leadership approaches are influenced by the Islamic boarding school paradigm. It also shows that the Islamic boarding school environment's consistent leadership and support have a significant impact on the strategy's success. As a result, putting this technique into practice involves cultural and pedagogical considerations in addition to technological ones.

Discussion

The role modeling approach at Al-Hikmah was consistent with transformative leadership theory, which highlighted the leader's example position as a change agent, in contrast to earlier research on digital leadership. These results also showed contextual variables that are part of the distinct organizational culture of Islamic boarding schools (Olowoselu, 2024 and

Sa'diyah et al., 2023). Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a crucial role in explaining how policies are carried out successfully (Ghirmai & Hongde, 2023; Munifah & Purwaningrum, 2023; Thien & Liu, 2024). This implied that a strategy's effectiveness is influenced by the leader's social and cultural legitimacy in addition to the technology employed. As a result, institutional, cultural, and leadership factors must all be taken into account at the same time when interpreting these results (Dwikurnaningsih, 2026; Fajar, 2024; Karim et al., 2025).

The Kiai's symbolic legitimacy, which speeds up the adoption of technology, is what makes this method successful. Additionally, these results show contextual variables that are part of the distinct organizational culture of Islamic boarding schools. Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a crucial role in explaining how policies are carried out successfully. This implied that the social and cultural legitimacy of the leader influences strategic success in addition to the technology employed. As a result, understanding these results necessitates taking leadership, cultural, and structural factors into account at the same time.

Comparatively speaking, Nurul Iman's authority delegation technique is consistent with the distributed leadership philosophy, which highlights the separation of duties. These results also showed contextual variables that are part of the unique organizational culture of Islamic boarding schools (Aira & Doom, 2025; Aristiati, 2023; Razali et al., 2024; Salim et al., 2024). Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a key role in deciding how well policies are carried out. This implies that a strategy's effectiveness is influenced by the leader's social and cultural legitimacy in addition to the technology employed. As a result, institutional, cultural, and leadership factors must all be taken into account at the same time when interpreting these results (Hartatik & Siswanto, 2023 and Yusuf, 2025).

This accomplishment can be causally attributed to the Kiai's combination of technical autonomy and value control. Additionally, these results show contextual variables that are part of the unique organizational culture of Islamic boarding schools. Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a key role in deciding how well policies are carried out. This implies that the social and cultural legitimacy of the leader influences strategic success in addition to the technology employed. As a result, understanding these results necessitates taking leadership, cultural, and structural factors into account at the same time.

The Darussalam approach has certain features that are more in line with normative leadership theory as compared to other studies. These results also show contextual variables that are part of the unique organizational culture of

Islamic boarding schools. Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a crucial role in explaining how policies are carried out successfully (Hunsker, 2023 and Koutroubas & Galanakis, 2023). The requirement to preserve the integrity of Islamic boarding school ideals gives birth to stringent fatwa-based regulation. Additionally, these results show contextual variables that are part of the unique organizational culture of Islamic boarding schools. Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a crucial role in explaining how policies are carried out successfully.

Al-Falah's stepwise approach is consistent with the long-term planning emphasis of strategic leadership theory. These results also show contextual variables that are part of the distinct organizational culture of Islamic boarding schools. Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity (Adhinugraha et al., 2024 and Listrianti & Cahyono, 2023). In this situation, the Kiai's leadership plays a key role in deciding how well policies are carried out. Formal policies and institutional support are causally responsible for this accomplishment. Additionally, these results show contextual variables that are part of the distinct organizational culture of Islamic boarding schools. Each institution develops its own adaptation patterns as a result of the interplay between traditional values and the needs of modernity. In this situation, the Kiai's leadership plays a key role in deciding how well policies are carried out.

By offering a contextual conceptual model within the *pesantren* setting, this work significantly advances the development of value-based digital leadership. By incorporating religious, cultural, and institutional aspects that are sometimes overlooked in popular literature, the findings not only enhance but also broaden the notion of digital leadership. Additionally, this study provides a typology of Kiai leadership methods as adaptive answers to technology constraints in distant education, spanning from normative legitimation to role modeling and delegating. Practically speaking, the findings can be used as a guide by *pesantren* administrators to create sustainable strategies for digital transition without compromising traditional values. As a result, this study helps close the gap between the sustainability of the *pesantren*-based educational ecology and technology prospects.

CONCLUSION

The results and discussion of this study suggest that the Kiai's leadership in incorporating values, culture, and contextually adaptive tactics is more important for the success of digital transformation in *pesantren* than just technological expertise. The growing pattern demonstrates that technology is only effective when it is implemented using methods consistent with the *pesantren* typology and is legitimized both culturally and religiously. The implied message is that innovation and value preservation must be balanced for

sustained digital transformation, with the Kiai serving as a crucial link between the two. This study has theoretical implications for extending the idea of digital leadership in a religious setting as well as practical ramifications for *pesantren* administrators in creating flexible, value-based digital strategies. It is constrained, therefore, by the small number of cases and the absence of more extensive geographic and cultural coverage. It is advised that future studies examine the long-term effects of digital leadership techniques on learning results and students' character development, as well as more diversified *pesantren* utilizing more in-depth comparison methods.

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