



Leadership of the Principal of MTs Anwaha in the Artificial Intelligence

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ARTIKEL INFORMATION	ABSTRACT
<p>Received: 2026-04-16</p>	<p><i>This study aims to analyze the leadership of the principal of MTs Anwaha in the era of artificial intelligence in developing and implementing Anwaha-specific AI through the A-Smart application as an institutional information service and data management system. The study employs a qualitative approach using a case study design conducted at MTs Anwaha. The research subjects consist of the school principal, teachers, educational staff, system administrators, and parents of students, selected through purposive sampling. Data collection techniques included in-depth interviews, observation, and documentation, while data analysis utilized the Miles and Huberman interactive model, encompassing data reduction, data presentation, and drawing conclusions. The research findings indicate that the principal's leadership has undergone a transformation toward visionary and contextual digital leadership. A-Smart serves as an information platform for parents regarding their children's well-being and boarding school programs, enhancing transparency and trust, while also functioning as a data backup system supporting the institution's sustainable governance. The implementation of AI in this study is not only focused on administrative efficiency but also on strengthening social relationships and institutional accountability. The conclusion of this study emphasizes that the success of AI integration in educational institutions is largely determined by leadership's ability to contextualize technology according to local needs. The implications of this study contribute to the development of an AI-based madrasah principal leadership model that is integrative, adaptive, and service-oriented in addressing the digital transformation of education.</i></p>
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INTRODUCTION

Advances in artificial intelligence have brought significant changes to the management of educational institutions, not only in terms of learning but also in organizational governance, institutional communication, decision-making, and data management. In this context, madrasah principals are required to transform from mere academic administrators into digital leaders capable of strategically integrating technology into the educational service system. Recent studies indicate that the integration of AI into school leadership can enhance administrative efficiency, strengthen data-driven decision-making, and accelerate institutional responses to the dynamics of the educational environment.¹

However, on-the-ground realities reveal a gap between technological advancements and the readiness of educational leadership, particularly in religious-based institutions such as madrasahs. Recent research reveals that studies on AI-based school leadership remain general in nature and have not yet extensively addressed the specific context of madrasahs, which possess distinct organizational cultural characteristics, religious values, and patterns of interaction with parents compared to public schools.² Furthermore, most research still focuses on administrative efficiency and decision-support systems, while aspects of institutional communication, information transparency toward parents, and data management have not been extensively examined in an integrated manner.³

¹ Lipsou, E., Keravnos, N., & Eteokleous, N. (2026). Artificial Intelligence in School Leadership: A Structured Literature Review of Organisational Benefits and Ethical Challenges

² Adams, D., & Thompson, P. (2025). Transforming School Leadership with Artificial Intelligence: Applications, Implications, and Future Directions.

³ Karakose, T., & Tulubas, T. (2025). The Role of Educational Leaders in the Age of Artificial Intelligence (AI).

In practice, one of the real challenges faced by educational institutions is the suboptimal communication system between schools and parents. Information regarding students' conditions or institutional programs is often scattered across various unintegrated channels, potentially leading to miscommunication and delays in information dissemination. In fact, recent research indicates that parental involvement in their children's education increasingly depends on access to fast, accurate, and structured digital information.⁴ Furthermore, effective digital communication between schools and families has been proven to be a key factor in enhancing parental trust and participation in the educational process.⁵

Another issue of equal importance relates to institutional data management. Digital transformation requires educational institutions to have secure, integrated, and sustainable data storage and backup systems. This is crucial given that technology-based educational governance relies heavily on the quality of the data available. Recent studies emphasize that educational leadership in the AI era must ensure data security, privacy, accountability, and transparency in information management.⁶

Furthermore, the success of AI implementation in educational institutions is significantly influenced by the leadership role of school principals or madrasah heads. AI cannot stand alone as a technological solution; rather, it requires visionary, adaptive, and collaborative leadership. Research indicates that school principals need to integrate transformational leadership practices

⁴ Cleveland, G., Bebell, D., & Xin, Z. (2024). Parents' Use of Technology to Stay Informed about Their Children's Education

⁵ Urbina, S., Ferrer-Ribot, M., & Moral, S. V. (2025). School Family Communication in Early Childhood Education Through Digital Tools

⁶ Liu, T., Luo, Y. T., Pang, P. C.-I., & Kan, H. Y. (2025). Exploring the Impact of Information and Communication Technology on Educational Administration: A Systematic Scoping Review

with the use of technology to drive comprehensive innovation adoption, including in building human resource capacity and strengthening relationships with stakeholders. Thus, AI is not merely a technical tool but an integral part of an education leadership strategy oriented toward change.⁷

On the other hand, technological advancements are also fundamentally transforming leadership practices. Educational leadership is no longer merely about performing administrative functions but must be capable of managing the complexity of digital systems involving data, human interactions, and strategic decisions. Research indicates that AI can expand the role of leadership in school management, yet it does not replace human elements such as empathy, values, and contextual considerations. Therefore, school principals need to develop leadership models capable of integrating technology with institutional values.⁸

In the context of MTs Anwaha, these challenges and opportunities are addressed through the development of Anwaha-specific AI and the implementation of the A-Smart application as an integrated system. A-Smart functions not only as an administrative tool but also as a source of information for parents regarding their children's well-being and the boarding school's programs, as well as a system for institutional data backup. This approach demonstrates that digital transformation at MTs Anwaha is not only focused on efficiency but also on information transparency, improved services for parents, and strengthened data governance.

⁷ Avidov-Ungar, O., & Ganon-Shilon, S. (2026). School Principals' Communication of Technology and Transformational Leadership Practices for Spreading the Adoption of an Artificial Intelligence in Education (AIED) Policy

⁸ Adams, D., & Thompson, P. (2025). Transforming School Leadership with Artificial Intelligence: Applications, Implications, and Future Directions.

The uniqueness of this study compared to previous research lies in three main aspects. First, this study focuses on the context of boarding school-based madrasahs, which have leadership characteristics distinct from general schools, thereby offering a new perspective in the study of AI-based educational leadership. Second, this study views AI not merely as an administrative tool but as a leadership instrument that directly supports communication between the institution and parents of students. Third, this study integrates information service functions and a data backup system into a single platform—an approach rarely discussed simultaneously in previous research. Thus, this study offers a contribution in the form of a contextual, integrative, and institution-needs-based leadership model for madrasah principals in the AI era.

Based on the above, this study aims to analyze how the principal of MTs Anwaha leads the implementation of Anwaha's unique AI through A-Smart as a means of providing information services to parents of students while also serving as an institutional data backup system. This study is expected to provide a theoretical contribution to the development of AI-based educational leadership studies, as well as a practical contribution to Islamic educational institutions in facing the challenges of digital transformation in the era of artificial intelligence.

RESEARCH METHODS

This study employs a qualitative approach using a case study design. This approach was chosen because the study aims to gain an in-depth understanding of the leadership practices of the principal of MTs Anwaha in implementing artificial intelligence (AI) through the A-Smart system within a real-world institutional context. The case study allows the researcher to comprehensively

explore leadership practices, decision-making processes, and the dynamics of technology use within a pesantren-based madrasah environment that possesses unique and contextual characteristics.

The research was conducted at MTs Anwaha, which was selected through purposive sampling because it is an institution that has developed Anwaha-specific AI through the A-Smart application as a means of providing information services to students' parents and as an institutional data backup system. Research subjects were determined using purposive sampling, taking into account direct involvement in the implementation of A-Smart and AI-based policies. Research subjects included the madrasah principal as the primary informant, as well as supporting informants consisting of teachers, educational staff, A-Smart system administrators, and parents of students who use the service.

Data collection techniques were conducted through in-depth interviews, observations, and documentation. In-depth interviews were conducted in a semi-structured manner to elicit information regarding leadership vision, AI implementation strategies, and experiences in using A-Smart as a medium for communication and data management. Observations were conducted to directly observe the use of A-Smart in the madrasah's operational activities, including interactions between school officials and parents. Meanwhile, documentation was used to collect data in the form of institutional policies, system usage reports, and data archives related to AI implementation at MTs Anwaha.

Data analysis was conducted using the Miles and Huberman interactive analysis technique, which comprises three main stages: data reduction, data presentation, and drawing conclusions. During the data reduction stage, the

researcher selected, focused, and simplified data relevant to the research focus. Subsequently, the data were presented in the form of descriptive narratives to facilitate the understanding of patterns and relationships among the findings. The final stage is drawing conclusions, which is conducted gradually and continuously throughout the research process until valid and credible findings are obtained.

To ensure the validity of the data, this study employed source triangulation and methodological triangulation. Source triangulation was conducted by comparing data obtained from various informants, such as the madrasah principal, teachers, and parents of students. Meanwhile, methodological triangulation is conducted by comparing the results of interviews, observations, and documentation. Additionally, the researcher conducts member checking to ensure that the data and interpretations obtained align with the reality intended by the informants.

This study also considers research ethics by ensuring that all informants provide informed consent, maintaining the confidentiality of informants' identities, and using data solely for academic purposes. Thus, this study is expected to yield findings that are not only scientifically valid but also ethical and accountable.

DISCUSSION

The findings of this study indicate that the leadership of the principal of MTs Anwaha in the AI era does not stop at administrative digitization, but moves toward strategic leadership that utilizes technology as a means of service delivery, strengthening relationships with students' parents, and ensuring data governance. From the perspective of transformational leadership theory, the

madrasah principal does not merely adopt technology but builds a vision, mobilizes stakeholders, and drives institutional cultural change. This argument aligns with the study by Cheah and Abdullah, which asserts that the influence of a principal's digital leadership on AI integration operates not solely through technical means but through resource support, cultural development, and professional growth. However, the findings from MTs Anwaha also expand this literature, as digital leadership here is not primarily directed at enhancing teachers' capacity to use AI in the classroom, but rather at creating an institutional system that serves the needs of the pesantren and students' families. Thus, the results of this study demonstrate that AI-based transformational leadership in madrasahs can take on a more socio-institutional form rather than merely an instructional one.⁹

1. The Leadership of the Principal of MTs Anwaha Is Transforming from a Conventional Administrative Model to AI-Based Digital Leadership

Research findings indicate that the principal of MTs Anwaha plays a central role in driving institutional change from a manual work system to an integrated digital system. This change did not occur spontaneously but stemmed from the principal's awareness that managing a madrasah in the AI era demands rapid service delivery, accurate information, and managerial efficiency. The principal functions not only as a decision-maker but also as the visionary guiding the digital transformation, which is translated into the development of Anwaha's unique AI system.

Interviews with key informants revealed that the principal views AI not merely as an additional technology but as a strategic necessity to enhance the

⁹ Cheah, Z. A., & Abdullah, Z. (2025). The influence of school principals' digital leadership on teachers' competency in integrating artificial intelligence: a systematic thematic review.

quality of the madrasah's services. In practice, madrasah principals establish policy directions that position A-Smart as an integral part of the institution's operational system. This is evident through internal policy support, the involvement of management teams, and adjustments to coordination patterns to make them more data- and system-driven.

Observations also indicate that this shift in leadership style impacts the institution's work culture. Before the implementation of A-Smart, information management tended to be fragmented and reliant on personal communication among stakeholders. After A-Smart was developed, work processes became more systematic as information could be managed within a single integrated system. Consequently, the leadership of madrasah principals appears to be shifting toward a more structured, predictive, and adaptive form of digital leadership capable of addressing contemporary challenges.

Theoretically, the first finding can also be explained through the Technology Acceptance Model (TAM). Within this framework, technology adoption is influenced by perceived usefulness and perceived ease of use.¹⁰ A recent study of school principals and vice principals in Turkey indicates that perceived usefulness and perceived ease of use are significantly associated with the intention to use AI, and are further linked to AI literacy and leadership efficacy; however, while the influence of AI literacy on self efficacy is deemed significant, it is weak. This means that technology acceptance by leaders is indeed important, but it is not automatically sufficient to guarantee institutional transformation.¹¹ At this point, the findings from MTs Anwaha are

¹⁰ Adiyono, A., Al Matari, A. S., Patimah, L., & AS, A. A. N. (2025). Can AI-Optimized YouTube Videos Enhance Islamic Religious Education? A Quantitative Study on Student Learning Outcomes. *Jurnal Pendidikan Agama Islam*, 22(1), 175-194.

¹¹ Syahrani, S. (2022). Model Kelas Anwaha Manajemen Pembelajaran Tatap Muka Masa Covid 19. *Al-Madrasah: Jurnal Ilmiah Pendidikan Madrasah Ibtidaiyah*, 6 (1), 38-47.

particularly interesting because the madrasah principal not only accepts AI as a useful technology but also translates it into a system with concrete institutional functions through A-Smart.¹² Thus, while TAM explains why a leader is willing to adopt AI, this study demonstrates that success at MTs Anwaha actually depends on the leader's ability to transform technology adoption into a contextual service architecture.¹³

2. Anwaha's AI System Developed as an Institutional Innovation Tailored to the Local Needs of Pesantren-Based Madrasahs

The research findings show that one of the key strengths of the leadership of the MTs Anwaha principal is his ability to guide the use of technology so that it does not merely replicate existing systems, but is tailored to the institution's specific needs. Anwaha's unique AI system emerged from the internal needs of the madrasah, which is situated within a pesantren environment; consequently, the system developed has a more context-specific orientation. In this regard, A-Smart was not built solely for the purposes of formal school administration, but also to address communication and information needs related to the lives of students and the pesantren's programs.

From documentation data and interview results, it is evident that the development of A-Smart was based on real-world challenges the institution had long faced, such as delays in information dissemination, inconsistencies in messages received by parents, and difficulties in maintaining sustainable data storage. Consequently, Anwaha's distinctive AI was designed as an institutional

¹² Syahrani, S. (2022). Peran Wali Kelas Dalam Pembinaan Disiplin Belajar di Pondok Pesantren Anwarul Hasaniyyah (Anwaha) Kabupaten Tabalong. *Al Qalam: Jurnal Ilmiah Keagamaan dan Kemasyarakatan*, 16 (1), 50-59.

¹³ Karakose, T., et al., (2025). Principals' Artificial Intelligence Literacy and Leadership Self-Efficacy: The Technology Acceptance Model

innovation capable of integrating critical information into a single channel that is easier to access and manage.

These findings indicate that the success of digital transformation at MTs Anwaha does not lie solely in technological sophistication, but in the alignment between technology and the institution's local needs. The school principal serves as the key figure ensuring that the Anwaha-specific AI remains grounded in the madrasah and pesantren culture, rather than functioning as a foreign system detached from the institution's reality.

The discussion of the second set of findings confirms that Anwaha's AI is not a generic innovation, but one born out of the local needs of pesantren-based madrasahs. Here, a socio-technical approach is crucial, as technology is not neutral but is always shaped by organizational structures, culture, user needs, and power relations. Recent studies on AI readiness among school leaders and teachers emphasize that AI adoption is not merely a technical issue, but a socio-technical and policy challenge requiring collaborative strategies, distributed leadership, and sensitivity to the implementation context. These findings challenge overly optimistic views that the sophistication of automated systems will automatically lead to improved governance. Research at MTs Anwaha, however, demonstrates that the core value of AI lies not in its level of sophistication, but in its alignment with the rhythm, culture, and real needs of the pesantren institution.¹⁴ Therefore, Anwaha's AI is better understood as a contextual innovation, not merely the adoption of a digital platform.

This argument is reinforced by Sposato's study, which notes that the primary challenge in integrating AI into educational leadership is the absence

¹⁴ Syahrani, S., Fidzi, R., & Khairuddin, A. (2022). Model Penggodokan Keikhlasan Santri Anwaha Marindi Dan Almadaniyah Jaro. *Al Qalam: Jurnal Ilmiah Keagamaan dan Kemasyarakatan*, 16 (3), 1184-1192.

of a comprehensive evaluation and implementation framework, leading many institutions to become trapped in fragmented adoption practices.¹⁵ Viewed from this perspective, the development of A-Smart at MTs Anwaha can be understood as an effort to avoid such fragmentation by creating a single system that serves three functions simultaneously: information services, strengthening relationships with parents, and data backup.¹⁶ On the other hand, the study by Lipsou et al. reminds us that AI in school leadership brings organizational benefits as well as ethical risks related to privacy, fairness, and accountability.¹⁷ In other words, this research not only demonstrates local success but also underscores that new contextual innovations will hold strategic value only if managed within an ethical and responsible governance framework.

3. A-Smart as a Source of Information for Parents of Boarding School Students About Their Children's Well-being and the Boarding School's Programs

One of the most notable findings of the study is the role of A-Smart as an information service platform that strengthens the relationship between the madrasah and the students' parents. Based on interviews with parents and educational staff, it was found that before the implementation of a more integrated system, parents often faced limited access to information regarding their children's well-being, academic activities, discipline, and boarding school programs. Information was typically obtained inconsistently, depending on specific forums or personal communication with school officials.

¹⁵ Sposato, M. (2025). Artificial Intelligence in Educational Leadership: A Comprehensive Taxonomy and Future Directions

¹⁶ Khair, A., Bukhari, A., Rahman, GA, & Amin, I. (2025). Manajemen Sistem Pendidikan Dalam Pengaplikasi Teknologi Digital Terhadap Pembelajaran Berani Pada Madrasah Tsanawiyah Anwarul Hasaniyyah. *Jurnal Pendidikan Dan Keguruan*, 1 (7), 2200-2215.

¹⁷ Lipsou, E., Keravnos, N., & Eteokleous, N. (2026). Artificial Intelligence in School Leadership: A Structured Literature Review of Organisational Benefits and Ethical Challenges

After A-Smart was implemented, parents gained clearer and more structured access to the information they needed. Field findings indicate that A-Smart enables parents to track their children's progress more quickly, including attendance status, specific activities, and information related to institutional programs. In this context, A-Smart functions not only as a medium for conveying information but also as a communication bridge that strengthens parents' trust in the madrasah.

Observation results show that this more open information system also leads to increased institutional transparency. Parents feel more connected to their children's educational process because they receive information more directly and continuously. From a leadership perspective, this demonstrates that the madrasah principal has successfully leveraged technology as a tool for public educational service, not merely as an internal administrative instrument.

The third finding namely, A-Smart's function as a source of information for students' parents can be discussed through the lens of stakeholder engagement and school-family partnership. A study by Urbina et al. indicates that the use of digital tools in school-family communication is considered effective, but remains influenced by users' technological competence and the platform's design, which must be secure and user friendly. Therefore, the existence of a digital system does not automatically result in good communication; its effectiveness depends on whether the platform can bridge the information needs of both parties. In this study, A-Smart was found to be positioned not merely as a one-way information broadcast channel, but as an information source that helps parents understand their children's condition and the

boarding school's programs in a more structured manner.¹⁸ Thus, these findings reinforce the literature on school-family digital communication while simultaneously shifting it to the context of madrasah-pesantren, where the school-home relationship involves higher emotional intensity and monitoring needs than in regular day schools.

Nevertheless, these research findings should also be interpreted critically in light of digital communication studies that tend to overemphasize the effectiveness of technology. Urbina et al. found that variations in digital competencies among families and educators can hinder two-way communication even when digital devices are available. This means that A-Smart's success in providing information to parents should not be interpreted to imply that all parents have the same access experience. In the context of Islamic boarding schools, differences in social background, digital literacy, and frequency of interaction with the institution are likely to influence how parents utilize the system. Therefore, theoretically, this study can be interpreted as supporting the view that effective digital leadership is not merely about providing technological channels but also ensuring the accessibility and social functionality of those channels. At this juncture, the school principal plays a role not only as an adopter of AI but as a manager of technology-mediated institutional relationships.¹⁹

¹⁸ Rifki, M. (2023). Manajemen Sarana Dan Prasarana Dalam Meningkatkan Efektivitas Media Pembelajaran Siswa-Siswi Di Madrasah Tsanawiyah Anwarul Hasaniyyah (Anwaha) Kabupaten Tabalong. *Jurnal Pendidikan Dan Keguruan*, 1 (6), 2040-2054.

¹⁹ Urbina, S., Ferrer-Ribot, M., & Moral, S. V. (2025). School Family Communication in Early Childhood Education Through Digital Tools

4. A-Smart Strengthens Transparency, Trust, and Parent Engagement in the Madrasah Education Ecosystem

This study also found that the use of A-Smart not only impacts the availability of information but also fosters stronger institutional relationships between madrasahs and students' parents. Several informants noted that more open access to information makes parents feel more at ease, more trusting, and better able to understand the programs implemented by madrasahs and pesantren. This trust grows because the institutions are perceived as being better prepared, more organized, and more accountable in providing information services.

From the perspective of madrasah principals, parental involvement is seen as a crucial component of the students' educational success. Therefore, A-Smart is utilized to establish communication that is not merely incidental but rather sustained. Research findings indicate that digital communication patterns via A-Smart help bridge the information gap between the institution and families, particularly within the boarding school environment where children are physically separated from their parents' direct supervision.

These findings suggest that the leadership of the MTs Anwaha principal is not only focused on system efficiency but also on strengthening institutional social relationships. In this context, technology serves as a tool for building accountability and trust two elements that are crucial in the governance of religious-based educational institutions.

The fourth finding indicates that A-Smart enhances transparency, trust, and parental engagement within the madrasah educational ecosystem. From the perspective of relational and transformational leadership theory, technology functions effectively when it helps build trust, a sense of inclusion,

and institutional legitimacy. Research by Avidov-Ungar and Ganon-Shilon shows that the adoption of AI policies in schools is heavily influenced by technology and transformational leadership practices that include capacity building, shared leadership, connections with parents, and external partnerships.²⁰ One key contribution of this study is its emphasis on the principal's role as a "boundary spanner" an actor who bridges policies, internal organizations, and external stakeholders. The findings from MTs Anwaha align with this argument, but with a distinct emphasis: connections with parents are not merely a strategy for persuading innovation adoption, but rather part of the institution's service to the families of boarding school students who are physically separated by the boarding school system.²¹

On the other hand, this discussion must also address critiques from AI ethics research. A recent review on ethical leadership in the AI era emphasizes that school principals face the dilemma of balancing efficiency with equity, and that ethical decisions regarding AI can foster trust but may also spark organizational conflict if not accompanied by guidelines, policies, and clear accountability. The findings from MTs Anwaha showing an increase in parental trust are indeed significant, but they also imply, from an argumentative perspective, the institution's obligation to ensure the accuracy of information, the privacy of students' data, and clarity regarding who is responsible in the event of a system error. Thus, the trust built by A-Smart cannot be separated from its ethical governance. Without this dimension, transparency can turn into a new vulnerability. In other words, this study supports the social function of AI

²⁰ Faradila, AN, & Sholehah, D. (2023). Manajemen Supervisi Pendidikan Di MTs Anwarul Hasaniyyah. *Jurnal Pendidikan Dan Keguruan*, 1 (6), 1797-1808.

²¹ Avidov-Ungar, O., & Ganon-Shilon, S. (2026). School Principals' Communication of Technology and Transformational Leadership Practices for Spreading the Adoption of an Artificial Intelligence in Education (AIED) Policy

in strengthening trust, but it must also be read through the critical warning that digital trust must be underpinned by clear governance.²²

5. A-Smart as a Data Backup Solution to Ensure the Security and Sustainability of Institutional Governance

The research findings indicate that another key function of A-Smart is as an institutional data backup system. Based on interviews with system administrators and administrative staff, it was found that data management previously relied heavily on manual archives and decentralized storage. This situation posed risks of data loss, duplication, and difficulties in retrieving data when needed for administrative, evaluation, or reporting purposes.

After A-Smart was established as a digital system, critical institutional data began to be stored more systematically and could serve as a backup when manual documents were unavailable or encountered issues. This is a significant finding because it demonstrates that digitization at MTs Anwaha is not only directed toward external information services but also toward strengthening the institution's internal systems. The school principal views the existence of data backups as part of efforts to maintain administrative continuity and institutional system resilience.

Observations of the documentation also indicate that the use of A-Smart as a data backup helps the institution improve the efficiency of archive searches, ensure information consistency, and prepare for audit and evaluation requirements. Thus, A-Smart serves a dual purpose: as a tool for external communication with parents and as an internal governance infrastructure that supports the sustainability of the madrasah's administration.

²² Almaki, S., et al., (2025). Principals' ethical leadership in the AI Era: A narrative literature review of emerging challenges, strategies, and outcomes.

The fifth finding regarding A-Smart as a data backup is particularly significant because it shifts the AI discussion away from the popular discourse on automation toward a more fundamental issue: data governance. The study by Lipsou et al. identifies privacy, fairness, and accountability as central ethical challenges as AI enters school leadership. Meanwhile, a systematic review on the ethics and governance of generative AI in education indicates that key areas of responsible governance include privacy and data protection, algorithmic fairness, transparency, well-being, and human oversight. If we apply this framework, the data backup function in A-Smart is not merely an additional administrative feature, but the foundation of institutional sustainability. A digitized educational institution without a well-organized data backup is, in fact, organizationally fragile. Therefore, the findings of this study expand the conversation on AI in educational leadership: the most strategic digital innovations are often not the “smartest,” but rather those most capable of maintaining institutional information continuity and accountability.

This argument is also supported by Liu et al.’s study on the impact of ICT on educational administration. The review concluded that ICT significantly enhances administrative efficiency, yet simultaneously highlights the need for inclusive and well-managed technological advancements to achieve a high-quality education system.²³ In this context, the use of A-Smart as a data backup indicates that the principal of MTs Anwaha does not view digital transformation merely as a means to accelerate work, but as a way to strengthen institutional memory. This is important because much of the research on madrasah digitization in Indonesia still focuses on academic services, correspondence

²³ Liu, T., Luo, Y. T., Pang, P. C.-I., & Kan, H. Y. (2025). Exploring the Impact of Information and Communication Technology on Educational Administration: A Systematic Scoping Review

services, or digital libraries. A study on madrasah digitalization by As-shodiq et al., for example, emphasizes the quality of digital-based academic services but does not specifically highlight the integration of parent information services and data backup as a leadership model. This is where this study provides a sharper additional perspective for the study of technology-based madrasah leadership.²⁴

When all the findings are synthesized, this study indicates that the leadership of the principal of MTs Anwaha is best understood through a combination of transformational leadership, TAM, distributed leadership, and ethical AI leadership. Transformational leadership explains the vision for change established by the madrasah principal; TAM helps explain why AI is considered appropriate for use; distributed leadership is important because the implementation of systems like A-Smart requires the involvement of administrators, teachers, and support staff; while ethical AI leadership explains that all these benefits must be framed by ethical responsibility, human oversight, and data governance.²⁵ Recent research even offers a six-domain framework for AI leadership in schools that emphasizes strategic vision, instructional innovation, equity, and stakeholder engagement as core competencies for school leaders in the AI era.²⁶ However, findings from MTs Anwaha indicate that, within the madrasah-pesantren context, the domains of stakeholder engagement and data stewardship appear more prominent than instructional AI use. This implies that the application of AI leadership theory

²⁴ As-shodiq, M. J., Sukur, M., Syamsuddin, H., & Huggins, B. A. (2025). Digitalisasi Madrasah: Strategi Kepala Madrasah Dalam Mewujudkan Quality Of Academic Service Berbasis Digital

²⁵ Ikhsan, M. (2025). Analysis of the Impact of Digital Transformation on Student Learning Outcomes in Islamic Education Subjects at MTsN 6 HSU. *Journal Innovative Practices in Education (JIPE)*, 1(1), 13-21.

²⁶ DeMatthews, D., Reyes, P., Hart, T. D., & James III, L. (2026). Leadership for artificial intelligence use in schools: A six-domain framework for ethical, equitable, and effective integration

must account for the type of institution, culture, and institutional challenges faced, rather than being applied uniformly across all schools.²⁷

The uniqueness of this study lies in several aspects. First, unlike many recent studies examining AI in the leadership of general schools, this research focuses on madrasahs within the pesantren ecosystem, so the relationships between the institution, students, and parents have a distinctive character. Second, this study does not view AI merely as a learning aid or a tool for administrative efficiency, but as an instrument of institutional leadership that integrates communication with parents and data governance. Third, the novelty of this study lies in the integration of Anwaha's distinctive AI, A-Smart, as a source of information for parents, and A-Smart as a data backup within a single framework of madrasah principal leadership. Recent literature tends to discuss digital leadership, AI literacy, institutional readiness, or AI ethics separately, whereas this study demonstrates how these three dimensions converge in a local, contextual, religious, and service-oriented practice. Therefore, its main contribution is not only empirical but also conceptual: this study offers an understanding that madrasah principal leadership in the AI era can be built from the social needs of the institution, not merely from a technological modernization agenda.

CONCLUDING

This study concludes that the leadership of the principal of MTs Anwaha in the era of artificial intelligence (AI) has undergone a transformation from conventional administrative practices toward a form of digital leadership that

²⁷ DeMatthews, D., Reyes, P., Hart, T. D., & James III, L. (2026). Leadership for artificial intelligence use in schools: A six-domain framework for ethical, equitable, and effective integration

is visionary, contextual, and service-oriented. This transformation is marked not only by the use of technology but also by the principal's ability to integrate AI into institutional systems relevant to the needs of a pesantren-based madrasah. Through the development of Anwaha's proprietary AI and the utilization of the A-Smart application, the principal has successfully established a leadership model that is not merely adaptive to technological advancements but also responsive to the needs of students, parents, and institutional governance.

Research findings indicate that A-Smart serves a strategic function in three key aspects: as an information service platform for students' parents, as a tool for enhancing institutional transparency and trust, and as a data backup system supporting the continuity of madrasah administration. These functions affirm that AI, in the context of MTs Anwaha, is not positioned merely as an administrative tool but as a leadership instrument capable of strengthening social relations between the institution and students' families while enhancing data governance accountability.

Theoretically, the findings of this study reinforce the relevance of transformational leadership, digital leadership, and socio-technical approaches in understanding AI implementation in educational institutions. However, this study also indicates that the success of AI integration is highly dependent on leaders' ability to contextualize the technology according to the institution's local characteristics. Thus, the adoption of AI cannot be viewed as a uniform, universal process but rather as a leadership practice that must be tailored to the needs, culture, and organizational structure of each institution.

The uniqueness of this study lies in the integration of madrasah-specific AI development, the utilization of A-Smart as an information source for students'

parents, and A-Smart's function as a data backup system within a single leadership framework. This demonstrates that technological innovation in Islamic education is not only oriented toward efficiency but also toward service, social relations, and the sustainability of institutional governance. Therefore, this study offers conceptual and practical contributions to the development of a contextual, integrative, and needs-based leadership model for madrasah principals in the AI era.

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