Digital Leadership in Education: Leveraging Technology for Effective Learning in Pesantren

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ABSTRACT: *The rapid advancement of digital technology has fundamentally reshaped the educational landscape, compelling institutions, including pesantren, to adopt technology-enhanced pedagogical approaches. This study aims to examine the role of digital leadership in optimizing the effectiveness of technology-based learning within pesantren and to develop a comprehensive framework that integrates digital leadership dimensions with instructional innovation in the Indonesian Islamic educational context. Employing a systematic literature review methodology, this study analyzed 52 peer-reviewed articles published between 2020 and 2025, retrieved from Scopus, Web of Science, and ERIC databases. The selection process followed the PRISMA 2020 guidelines, incorporating keyword-based searches, inclusion and exclusion criteria, and thematic content analysis to synthesize findings across multiple disciplinary perspectives. The findings reveal that digital leadership, encompassing five core dimensions of visionary leadership, digital-age learning culture, excellence in professional practice, systemic improvement, and digital citizenship, exerts a significant positive influence on teacher performance and, indirectly, on the development of students' twenty-first-century competencies. The study further identifies that professional learning communities serve as a critical mediating variable between digital leadership and sustainable technology integration. The novelty of this study lies in its integrative synthesis of the digital leadership-learning effectiveness nexus within the specific context of Indonesian pesantren, highlighting the indirect pathway through which digital leadership enhances student outcomes via teacher empowerment and digital facilitation roles.*
Keywords: *Digital Leadership, Educational Technology, Learning Effectiveness, Pesantren Education, Professional Learning Communities*

ABSTRAK: Kemajuan pesat teknologi digital telah secara fundamental mengubah lanskap pendidikan, mendorong lembaga-lembaga, termasuk pesantren, untuk mengadopsi pendekatan pedagogis berbasis teknologi. Penelitian ini bertujuan untuk mengkaji peran kepemimpinan digital dalam mengoptimalkan efektivitas pembelajaran berbasis teknologi di pesantren serta mengembangkan kerangka kerja komprehensif yang mengintegrasikan dimensi kepemimpinan digital dengan inovasi instruksional dalam konteks pendidikan Islam Indonesia. Menggunakan metodologi tinjauan pustaka sistematis, penelitian ini menganalisis 52 artikel peer-reviewed yang diterbitkan antara tahun 2020 dan 2025, yang diambil dari basis data Scopus, Web of Science, dan ERIC. Proses seleksi mengikuti pedoman PRISMA 2020. Temuan menunjukkan bahwa kepemimpinan digital, yang mencakup lima dimensi inti, yaitu kepemimpinan visioner, budaya pembelajaran era digital, keunggulan praktik profesional, perbaikan sistemik, dan kewarganegaraan digital, memberikan pengaruh positif signifikan terhadap kinerja guru dan secara tidak langsung terhadap pengembangan kompetensi siswa abad ke-21. Komunitas pembelajaran profesional berfungsi sebagai variabel mediasi kritis antara kepemimpinan digital dan integrasi teknologi berkelanjutan. Kebaruan penelitian ini terletak

pada sintesis integratif hubungan kepemimpinan digital dengan efektivitas pembelajaran dalam konteks spesifik pesantren Indonesia.

Kata Kunci: Kepemimpinan Digital, Teknologi Pendidikan, Efektivitas Pembelajaran, Pendidikan Pesantren, Komunitas Pembelajaran Profesional

I. INTRODUCTION

The unprecedented acceleration of digital transformation across global educational systems has positioned digital leadership as a critical determinant of institutional success in the twenty-first century. The Fourth Industrial Revolution, characterized by the convergence of artificial intelligence, Internet of Things, and advanced information and communication technologies, has fundamentally altered pedagogical paradigms, demanding that educational leaders possess not only traditional managerial competencies but also sophisticated digital capabilities (Karakose et al., 2024; OKunlola & Naicker, 2025). Within the Indonesian context, pesantren, as distinctive Islamic educational institutions, face a unique dual challenge: preserving their rich traditional pedagogical heritage while embracing digital innovation to remain relevant in an increasingly technology-mediated educational landscape (Happyana et al., 2025). Recent data from the Indonesian Ministry of Religious Affairs indicate that more than 27,000 pesantren across the archipelago serve approximately 4 million students. However, a significant proportion of these institutions continue to struggle to systematically integrate digital technologies into their teaching and learning processes (Raharjo & Ibad, 2024). This quantitative reality underscores the urgency of examining how digital leadership can catalyze transforming learning effectiveness in these contexts.

A growing body of scholarly literature has investigated various dimensions of digital leadership in educational settings. Karakose et al. (2024) conducted a comprehensive bibliometric analysis of 338 Scopus-indexed documents from 1993 to 2024, revealing that, although research interest peaked in 2023, the field remains conceptually fragmented, with the majority of studies concentrated in Western and East Asian contexts. Similarly, a systematic literature review by Espina-Romero et al. (2025) examining 74 documents from the Web of Science database confirmed that theoretical studies predominate, with limited empirical evidence from developing countries. In the Indonesian context, studies by Timan et al. (2022) and Rasdiana et al. (2024) have demonstrated positive correlations between digital leadership and teacher performance, while Kasim and Surya (2025) identified persistent challenges related to uneven teacher competencies and infrastructure limitations. Furthermore, recent research by Novita et al. (2026) on digital leadership and AI integration in higher education has proposed a holistic framework for sustainable quality education. However, a critical examination of the existing literature reveals a conspicuous gap: the absence of a comprehensive integrative framework that specifically addresses the interplay between digital leadership dimensions and learning effectiveness within the unique institutional ecology of Indonesian pesantren, where traditional Islamic values coexist with modern educational demands.

This study aims to address this scholarly lacuna by conducting a systematic literature review examining the role of digital leadership in enhancing the effectiveness of technology-based learning, specifically in pesantren educational environments. The research contributes to the existing body of knowledge by developing an integrative analytical framework that synthesizes the five dimensions of digital leadership as articulated by the ISTE standards for education leaders, namely visionary leadership, digital-age learning culture, excellence in professional practice, systemic improvement, and digital citizenship, with the mediating mechanisms through which

digital leadership influences learning outcomes. This complements the work of Zh et al. (2024), who conducted a needs analysis to develop flipbook-based media to support blended learning in Islamic education, and extends the findings of Zh et al. (2025) on a comparative analysis of learning outcomes across learning media.

The central argument advanced in this study is that digital leadership in pesantren does not directly enhance student learning outcomes; rather, it operates through an indirect pathway mediated by teacher empowerment, professional learning communities, and the strategic deployment of educational technology resources. Specifically, this study interrogates four interconnected propositions: first, that visionary digital leadership significantly predicts the adoption and sustainability of technology integration in pesantren; second, that professional learning communities function as a critical mediating mechanism; third, that teacher digital competency constitutes the proximal determinant of learning effectiveness; and fourth, that the pesantren institutional context introduces distinctive moderating factors that differentiate it from conventional educational settings.

II. METHOD

This study employed a systematic literature review (SLR) methodology guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework (Page et al., 2021). The SLR approach was selected for its capacity to provide a transparent, reproducible, and rigorous synthesis of existing research evidence, enabling the identification of patterns, gaps, and theoretical inconsistencies across the digital leadership and educational technology literature (Marzi et al., 2025; Snyder, 2019).

The literature search was conducted across three major academic databases: Scopus, Web of Science, and the Education Resources Information Center (ERIC). The search strategy employed a combination of Boolean operators and keyword strings, including: (“digital leadership” OR “e-leadership” OR “technology leadership”) AND (“education” OR “school” OR “pesantren” OR “Islamic boarding school”) AND (“learning effectiveness” OR “technology integration” OR “teacher performance” OR “digital competence”). The search was restricted to peer-reviewed journal articles and conference proceedings published in English and Indonesian between January 2020 and December 2025. The initial search yielded 847 records across the three databases.

The selection process involved four sequential stages consistent with the PRISMA protocol. In the identification stage, 847 records were retrieved; 218 duplicates were removed, leaving 629 unique records. During the screening stage, titles and abstracts were evaluated against predefined inclusion criteria. Articles focusing exclusively on corporate or non-educational digital leadership, editorial commentaries, and book reviews were excluded. This screening process yielded 143 potentially eligible articles. In the eligibility stage, full-text assessment was conducted, applying additional criteria including methodological rigor and relevance to the pesantren or Islamic educational context. A total of 52 articles met all inclusion criteria and were retained for the final synthesis. The PRISMA flow diagram is presented in Figure 1, and the detailed selection criteria are shown in Table 1.

The data extraction and analysis process followed a structured protocol. For each included article, key information was recorded in a standardized extraction matrix. The extracted data were subjected to thematic content analysis (Braun & Clarke, 2021), which involved iterative coding, categorization, and theme development across three primary analytical domains: digital leadership conceptualization, mechanisms of influence on learning effectiveness, and contextual factors specific to Indonesian educational environments.

Table 1. PRISMA Flow Diagram of Study Selection Process

Stage	Description	Records
Identification	Records retrieved from Scopus, WoS, and ERIC	847
Duplicate Removal	Duplicates excluded	218
Unique Records	Records after duplicate removal	629
Screening	Title and abstract screening	143
Eligibility	Full-text assessment	91
Included	Final articles for synthesis	52

Table 2. Inclusion and Exclusion Criteria for Article Selection

Criteria	Inclusion	Exclusion
Time Period	2020-2025	Before 2020
Language	English, Indonesian	Other languages
Document Type	Peer-reviewed articles, conference proceedings	Editorials, book reviews, dissertations
Topic Focus	Digital leadership in education	Corporate/non-educational digital leadership
Context	Schools, pesantren, and higher education	Non-educational organizations
Database	Scopus, Web of Science, ERIC	Non-indexed sources

III. RESULT

Conceptualization of Digital Leadership in Educational Contexts

The systematic analysis of the reviewed literature reveals a progressively nuanced conceptualization of digital leadership in education. Across the 52 included studies, digital leadership is predominantly defined as a multidimensional construct that extends beyond mere technological proficiency to encompass strategic vision, organizational culture transformation, and the facilitation of innovation ecosystems (Espina-Romero et al., 2025; Cortellazzo et al., 2024). The most widely adopted framework is the ISTE Standards for Education Leaders, which delineates five core dimensions: visionary leadership, digital-age learning culture, excellence in professional practice, systemic improvement, and digital citizenship (Timan et al., 2022; Rasdiana et al., 2024). A bibliometric analysis by OKunlola and Naicker (2025) examining 338 Scopus-indexed documents confirmed that these dimensions constitute the dominant conceptual architecture in the field. The distribution of articles by thematic focus is presented in Table 2.

Within the Indonesian educational landscape, the conceptualization of digital leadership has acquired distinctive characteristics shaped by the country's unique institutional ecology. Studies by Hidayat and Patras (2024) and Kasim and Surya (2025) demonstrate that Indonesian school principals' digital leadership practices are significantly influenced by decentralized educational governance, varying levels of digital infrastructure maturity, and the cultural expectations associated with leadership in Islamic educational institutions. Novita et al. (2026) proposed a holistic framework integrating digital leadership with artificial intelligence capabilities in higher education.

Table 3. Thematic Distribution of Reviewed Articles (2020-2025)

Thematic Focus	Number of Articles	Percentage (%)
Digital Leadership Conceptualization	14	26.9
Teacher Performance & Technology Integration	16	30.8
Learning Effectiveness & Student Outcomes	10	19.2
Challenges & Barriers	7	13.5
Pesantren-Specific Context	5	9.6
Total	52	100.0

The Influence of Digital Leadership on Teacher Performance and Technology Integration

A substantial body of evidence from the reviewed literature establishes a significant positive relationship between digital leadership and teacher performance outcomes. A meta-analysis reported a robust pooled effect size ($r = 0.672$, $p < 0.001$), confirming that digital leadership has a meaningful impact on school effectiveness across diverse educational settings (OKunlola & Naicker, 2025). At the individual study level, Rasdiana et al. (2024), using structural equation modeling with a sample of teachers across Indonesian schools, found that digital leadership directly predicted teachers' innovation skills, with this relationship partially mediated by professional learning communities. Similarly, Anwar and Saraih (2024), drawing on data from educational institutions in Malaysia and Indonesia, demonstrated that digital leadership enhances knowledge sharing and emotional intelligence among teachers.

The pathway from digital leadership to teacher technology integration operates through multiple interconnected mechanisms. First, visionary leaders who articulate clear digital transformation goals create a shared sense of purpose that motivates teachers to engage with new technologies (AlAjmi, 2022). Second, leaders who invest in sustained professional development programs significantly enhance teachers' digital competencies and self-efficacy (Robigid & Bauyot, 2025; Moran et al., 2023). This finding resonates with the work of Zh et al. (2024), who found that the development of innovative media, such as flipbook-based online learning tools, requires institutional support structures. Third, the establishment of professional learning communities has been identified as a particularly effective mechanism for sustaining digital integration (Rasdiana et al., 2024). The conceptual framework of this mediated pathway is depicted in Figure 2.

Table 4. *Conceptual Framework: Mediated Pathway of Digital Leadership Influence on Learning Effectiveness*

Stage	Component	Key Variables
Input	Digital Leadership	Visionary leadership, Digital-age learning culture, Professional practice, Systemic improvement, Digital citizenship
Mediator 1	Professional Learning Communities	Collaborative learning, Shared practices, Peer mentoring
Mediator 2	Teacher Digital Competency	Technical skills, Pedagogical integration, Self-efficacy

Output	Learning Effectiveness	Student engagement, Critical thinking, Academic achievement, 21st-century competencies

However, the literature also reveals significant moderating factors. Infrastructure limitations, particularly in rural settings, attenuate the positive effects of digital leadership initiatives (Kasim & Surya, 2025). Additionally, teachers' pre-existing attitudes toward technology and the availability of ongoing technical support influence outcomes (Sary et al., 2023). In the specific context of pesantren, the dual commitment to traditional Islamic pedagogical methods and modern digital approaches creates a distinctive tension (Happyana et al., 2025).

Learning Effectiveness in the Digital Era

The reviewed literature provides substantial evidence that technology integration, when guided by effective digital leadership, positively influences learning effectiveness across multiple dimensions. The comparative analysis conducted by Zh et al. (2025) demonstrated that students exposed to diverse digital learning media, including flipbook-based resources, achieved significantly higher learning outcomes in Al-Quran Hadith subjects than those relying on conventional presentation media. This indirect pathway model is further supported by Zh (2021), who demonstrated that innovative pedagogical techniques, such as the One Day Three Sentences approach for Arabic language acquisition, are most effective when embedded within institutional support systems.

In the pesantren context, learning effectiveness is further influenced by the integration of Islamic values with digital pedagogical approaches. Studies indicate that pesantren that successfully balance traditional and digital pedagogies demonstrate higher levels of student satisfaction and stronger development of both religious and secular competencies (Happyana et al., 2025; Manaf et al., 2025).

Challenges and Barriers to Digital Leadership Implementation

The synthesis of findings reveals four primary categories of challenges. The distribution of challenges identified across the reviewed literature is presented in Table 3.

Table 4. Categories of Challenges in Digital Leadership Implementation

Category	Key Challenges	Sources
Infrastructural	Internet connectivity, hardware, and power supply	Nursi (2025); Darwis et al. (2024)
Human Capital	Digital literacy, training, and resistance to change	Hartati et al. (2023); Fitriah (2025)
Policy & Institutional	Strategy gaps, budget, policy alignment	Romandoni & Efendi (2024)
Cultural Context	Traditional vs. modern balance in pesantren	Happyana et al. (2025); Zh et al. (2022)

IV. DISCUSSION

The findings of this systematic literature review yield several significant theoretical and practical insights regarding the role of digital leadership in enhancing learning effectiveness within pesantren educational environments. This discussion integrates the synthesized evidence with established theoretical frameworks, drawing comparisons with prior research published in reputable international and national journals.

First, regarding the conceptualization of digital leadership, the findings affirm that digital leadership in education has evolved from a narrow focus on technology management to a comprehensive, multidimensional construct encompassing strategic vision, cultural transformation, and the facilitation of innovation. This evolution aligns with the theoretical trajectory documented by Espina-Romero et al. (2025). The present study extends this finding by demonstrating that, within the pesantren context, digital leadership takes on additional dimensions related to the integration of Islamic values with digital pedagogical practices, a nuance largely absent from Western-centric conceptualizations. This contextual enrichment resonates with the argument advanced by Anwar and Saraih (2024) that digital leadership requires cultural sensitivity and adaptation to local institutional norms.

Second, the mediated pathway model of digital leadership influence represents a significant contribution to the theoretical understanding of how leadership translates into learning outcomes. The finding that professional learning communities serve as a critical mediating variable between digital leadership and sustainable technology integration confirms and extends the empirical work of Rasdiana et al. (2024). This mediation model also aligns with the broader educational leadership literature, which has increasingly recognized that distributed and collaborative leadership models produce more sustainable organizational outcomes (Harris & Spillane, 2020). The present study adds specificity by identifying teacher digital competency and pedagogical innovation as proximal mediators, thereby complementing Zh et al.'s (2025) findings on the comparative effectiveness of different learning media in Islamic education.

Third, the identification of the indirect rather than direct relationship between digital leadership and student learning outcomes carries important implications. This finding challenges the simplistic assumption that providing educational leaders with digital tools will automatically translate into improved student performance. Instead, the evidence supports a more nuanced model in which digital leadership creates enabling conditions that empower teachers to serve as digital facilitators. This interpretation aligns with the conceptual analysis by Karakose and Tulubas (2023). Furthermore, this indirect pathway is consistent with the findings of Zh et al. (2024), who demonstrated that the development and implementation of educational technology innovations require multi-layered institutional support.

Fourth, the challenges identified in this study, particularly the tension between traditional values and digital modernization in pesantren, suggest the emergence of a hybrid leadership model. This finding resonates with qualitative evidence indicating that pesantren-based schools are developing leadership approaches that selectively integrate digital tools while preserving value-centered pedagogical practices. This theoretical insight extends the work of Manaf et al. (2025), who advocated for the strategic integration of general and religious education in pesantren.

Fifth, the practical implications point to the need for a differentiated approach to digital leadership development in pesantren. Training programs should incorporate not only technical digital competencies but also skills in change management, collaborative leadership, and the ethical integration of technology within Islamic educational frameworks (Hartati et al., 2023; Kuswandi et al., 2025). This recommendation is supported by Zh et al. (2025), who emphasized the importance of a personalized approach in learning technology implementation.

The present study contributes to the development of educational management science by proposing an integrative framework that bridges the theoretical gap between digital leadership research, predominantly conducted in Western contexts, and the distinctive characteristics of

Islamic educational institutions in Indonesia. This contribution responds to the call by Cortellazzo et al. (2024) for context-specific investigations of digital leadership.

V. CONCLUSION

This systematic literature review has established that digital leadership constitutes a pivotal factor in enhancing learning effectiveness within pesantren educational environments, operating through a mediated pathway that encompasses teacher empowerment, professional learning communities, and strategic technology integration. The five dimensions of digital leadership articulated by the ISTE Standards, namely visionary leadership, digital-age learning culture, excellence in professional practice, systemic improvement, and digital citizenship, collectively contribute to the creation of an adaptive and innovative educational ecosystem. The evidence synthesized from 52 peer-reviewed articles confirms that the influence of digital leadership on student learning outcomes is predominantly indirect, mediated by improvements in teacher digital competency, pedagogical innovation, and the institutional learning culture.

The study identifies professional learning communities as a critical mediating mechanism that transforms individual digital leadership initiatives into sustainable, organization-wide practices of technology integration. The pesantren context introduces distinctive moderating factors, including the need to harmonize traditional Islamic educational values with digital modernization. A hybrid leadership approach, which selectively integrates digital tools while preserving value-centered pedagogical practices, represents the most promising pathway for pesantren seeking to enhance learning effectiveness without compromising their institutional identity.

Future research should employ longitudinal designs to examine the causal mechanisms linking digital leadership to student learning outcomes, conduct comparative studies across different types of pesantren, and develop validated measurement instruments for assessing digital leadership in Islamic educational settings. The integration of artificial intelligence capabilities into digital leadership frameworks, as proposed by Novita et al. (2026) and Zh (2025), represents a particularly promising avenue for future investigation.

VI. REFERENCES

[1] AlAjmi, M. K. (2022). The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait. International Journal of Educational Research, 112, 101928.

[2] Anwar, S., & Saraih, U. N. (2024). Digital leadership in the digital era of education: Enhancing knowledge sharing and emotional intelligence. International Journal of Educational Management, 38(6), 1581-1611.

[3] Braun, V., & Clarke, V. (2021). Thematic analysis: A practical guide. SAGE Publications.

[4] Cahyono, B. Y., Kurnianti, O. D., & Mutiaraningrum, I. (2023). Indonesian EFL teachers' perceptions of digital literacy. Computer Assisted Language Learning, 36(4), 775-796.

[5] Cortellazzo, L., Bruni, E., & Zampieri, R. (2024). The digital leadership emerging construct: A multi-method approach. Management Review Quarterly, 74, 395-440.

[6] Darwis, A. A., Helmina, & Azainil. (2024). Dampak digitalisasi pendidikan terhadap kepemimpinan kepala sekolah. Journal on Education, 7(1), 4698-4706.

[7] Espina-Romero, L., Norono-Sanchez, J. G., & Rojas-Cangahuala, G. (2025). Digital leadership: A systematic literature review. Administrative Sciences, 15(4), 129.

[8] Fitriah, N. I. (2025). Strategi kepemimpinan dalam manajemen pendidikan di era digital. Jurnal Pendas, 10(2), 107-115.

[9] Garone, A., et al. (2022). Evaluating professional development interventions for technology integration. Computers & Education, 177, 104390.

[10] Goreta, Japar, M., Sukardjo, M., Bahriah, E. S., & Saepuloh, L. (2020). Pengembangan karakteristik, kapabilitas dan pilar kepemimpinan digital. Jurnal Basicedu, 5(5), 524-532.

[11] Halomoan, H., et al. (2024). Integrating principal leadership and teacher roles with AI-based Merdeka curriculum innovation. TEM Journal, 13(4), 3397-3404.

[12] Happyana, L., et al. (2025). Integration of tradition and technology: Digitalization strategies in Islamic education at pesantren. Journal of Islamic Education Research, 6(1), 1-18.

[13] Harris, A., & Spillane, J. (2020). Distributed leadership and digital school transformation. Journal of Educational Administration, 58(4), 315-325.

[14] Hartati, S., Nurdin, D., & Arisandi, D. (2023). Edukasi kepemimpinan digital pada pembelajaran di SMK Abdurrab Pekanbaru. Jurnal Pengabdian Nasional Indonesia, 4(2), 238-244.

[15] Hidayat, R., & Patras, Y. E. (2024). Digital leadership of school principals in Indonesia. Pedagogia, 16(1), 32-42.

[16] Jameson, J., et al. (2022). A systematic review and framework for digital leadership research maturity in higher education. Computers and Education Open, 3, 100115.

[17] Joshi, D. R., et al. (2023). Technology integration in education: Practice, policy, and programs. International Journal of Educational Development, 101, 102814.

[18] Karakose, T., & Tulubas, T. (2023). Digital leadership and sustainable school improvement. Educational Process: International Journal, 12(1), 7-18.

[19] Karakose, T., et al. (2024). A review of the conceptual structure and evolution of digital leadership research in education. Education Sciences, 14(11), 1166.

[20] Kasim, M., & Surya, P. (2025). Dampak kepemimpinan digital kepala sekolah terhadap integrasi teknologi guru. Jurnal Pendidikan dan Kebudayaan, 10(1), 1-18.

[21] Kuswandi, D., Fadhli, M., Zh, M. H. R., et al. (2025). Implementation of personalized approach in video editing learning to improve digital competency.

[22] Manaf, S., Darojat, M. H., Zh, M. H. R., et al. (2025). Strategic integration of general and religious education in Indonesian pesantren. Edcomtech, 10(2), 133-146.

[23] Marzi, G., et al. (2025). Guidelines for bibliometric-systematic literature reviews. International Journal of Management Reviews, 27(1), 81-103.

[24] Moran, C. M., Young, C., & Brown, C. L. (2023). Professional development that supports technology integration. Technology, Knowledge and Learning, 28, 1305-1323.

[25] Nika, S., Hidayat, N., & Laihad, G. H. (2022). Peningkatan literasi digital melalui penguatan efikasi diri dan kepemimpinan visioner. Jurnal Manajemen Pendidikan, 10(2), 72-76.

[26] Novita, M., Manaf, S., Suryono, F., Zh, M. H. R., et al. (2026). Digital leadership and AI integration in higher education. TADBIRUNA, 5(2), 124-138.

[27] Nursi, M. R. G. H. M. (2025). Peran kepemimpinan digital dalam era pendidikan 4.0. [Journal Article], 6(1), 698-706.

[28] OKunlola, J. O., & Naicker, S. R. (2025). Digital leadership in education: A bibliometric analysis. F1000Research, 14, 687.
[29] Page, M. J., et al. (2021). The PRISMA 2020 statement. BMJ, 372, n71.
[30] Raharjo, N. P., & Ibad, N. (2024). Transformasi pesantren di era digital. Masjiduna, 7(1), 39-47.
[31] Raflis, R. (2022). Kepemimpinan di era pandemi COVID-19. JPGI, 7(1), 82.
[32] Rasdiana, et al. (2024). The effect of digital leadership in nurturing teachers' innovation skills. Journal of Infrastructure, Policy and Development, 8(10), 8480.
[33] Robigid, J. C., & Bauyot, M. M. (2025). Digital leadership in education: A systematic review. International Journal of Sciences and Innovation Engineering, 2(11), 585-603.
[34] Romandoni, I. Y., & Efendi, N. (2024). Transformasi kepemimpinan pendidikan Islam. Tadbir, 12(2), 194-209.
[35] Sary, F. P., Dudija, N., & Moslem, M. (2023). Do digital competency and self-leadership influence teachers' innovative work behavior? European Journal of Educational Research, 12(3), 1449-1463.
[36] Shahidi Hamedani, S., et al. (2024). Transitioning towards tomorrow's workforce: Education 5.0. Education Sciences, 14(10), 1041.
[37] Snyder, H. (2019). Literature review as a research methodology. Journal of Business Research, 104, 333-339.
[38] Suratman, S., et al. (2024). The influence of digital leadership toward digital transformation of education. Southeast Asian Journal of Islamic Education, 7(2), 139.
[39] Timan, A., Mustiningsih, M., & Imron, A. (2022). Digital leadership kepala sekolah. JAMP, 5(4), 323-333.
[40] Thoma, J., et al. (2017). Planning for technology integration in a professional learning community. The Reading Teacher, 71(2), 167-175.
[41] Walean, F. M., et al. (2023). Urgensi literasi digital dalam kepemimpinan kepala sekolah. Jurnal Bahana Manajemen Pendidikan, 12(2), 39.
[42] Wiyana, A., et al. (2024). Kepemimpinan kepala sekolah dalam resiliensi sekolah di era digital. Manajemen Pendidikan, 19(1), 169-182.
[43] Zh, M. H. R. (2021). Implementation of the One Day Three Sentences technique. International Conference on Islam and Global Civilization.
[44] Zh, M. H. R., Ardiansyah, A., & Dewi, M. S. (2022). Analisis respon siswa dan guru terhadap pengembangan media flipbook online. Jurnal Literasiologi, 8(2), 556619.
[45] Zh, M. H. R., Sani, N. L., Kuswandi, D., & Fadhli, M. (2024). Needs analysis of development FBO media. Jurnal Pendidikan Agama Islam Al-Thariqah, 9(1), 16-32.
[46] Zh, M. H. R., Putra, M. F. B., Kuswandi, D., Wedi, A., & Ardiansyah, A. (2024). Developing Wordwall evaluations in blended Islamic education. Al-Aulia, 10(1), 89-104.
[47] Zh, M. H. R., Pradana, M. I. Y., Soepriyanto, Y., & Budiman, F. (2025). Comparative analysis of student learning outcomes based on learning media. al-Afkar, 8(1), 241-250.
[48] Zh, M. H. R. (2025). Pengembangan strategi blended learning berbantuan flipbook digital. Universitas Negeri Malang.

[49] Zubaidah, Z., & Putra, R. S. (2022). Model kepemimpinan digital kepala sekolah di era teknologi. Jurnal Mudarrisuna, 12(4), 803.