

Islamic Value-Based Transformational Leadership, Digital Transformation, and Quality Culture in Pesantren-Based Madrasah Aliyah

Jailani Syahputra Siregar¹, Betti Megawati², Nursalimah³, Ruwaidah⁴

^{1,2,3,4}Universitas Al Washliyah Labuhanbatu, Labuhanbatu, Indonesia

Article Info

Article history:

Received 2026-05-28

Revised 2026-07-12

Accepted 2026-07-13

Keywords:

Digital Transformation

Islamic Boarding School

Islamic Values

Madrasah Aliyah

Quality Culture

Systematic Literature Review

Transformational Leadership

ABSTRACT

Digital transformation has reshaped educational governance and requires Islamic educational institutions to adapt not only through technological innovation but also through leadership, organizational culture, and quality improvement. In Islamic boarding school-based Madrasah Aliyah, this transformation is more complex because it must preserve Islamic values and institutional identity while responding to rapid technological change. This study aims to synthesize the literature on how Islamic values-based transformational leadership supports digital transformation and quality culture in Islamic educational management. This study employed a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines. Literature published between 2021 and 2026 was retrieved from Scopus, Web of Science, ERIC, ScienceDirect, and Google Scholar. A total of [N] records were identified, [N] duplicates were removed, [N] articles were screened, [N] were excluded after eligibility assessment, and 10 core studies (2023–2026) were included in the final thematic synthesis. The findings reveal four recurring themes: (1) Islamic values as a source of leadership legitimacy, (2) transformational leadership as the driver of digital transformation, (3) quality culture as the outcome of institutionalized organizational practices, and (4) structural and cultural barriers to change. This review proposes a conceptual model in which Islamic values strengthen transformational leadership, which, in turn, supports digital transformation and the institutionalization of a quality culture. The study contributes theoretically by integrating these four dimensions into a coherent framework and provides practical implications for school leaders, Islamic boarding school administrators, and policymakers seeking to strengthen digital transformation while maintaining the distinctive values of Islamic education.

This is an open-access article under the [CC BY-SA](#) license.



Corresponding Author:

Jailani Syahputra Siregar

Faculty of Islamic Religion, Islamic Religious Education, Universitas Al Washliyah Labuhanbatu

Email: jailanisiregar88@gmail.com

1. INTRODUCTION

Digital transformation has become one of the main agendas in 21st-century education reform. Digitalization is no longer just about using technology; it is now seen as a systemic change encompassing organizational governance, communication patterns, learning processes, and the development of an adaptive work culture. Recent studies show that the success of digital transformation depends on integrating organizational strategy, leadership, and institutional culture. McCarthy et al. [1] emphasize that education leaders need to move from partial digital innovations to more integrated, sustainable changes. Along the same lines, Reis-Andersson [2] points out that leaders' perceptions of digitalization affect organizational priorities, collaboration, and the positioning of technology within educational institutions.

In the context of Islamic education, digital transformation presents more complex challenges because changes are not only aimed at improving the efficiency and effectiveness of services, but also at maintaining the institution's Islamic identity and values. Azhari [3] emphasizes that Islamic educational institutions must implement adaptive management by integrating technology into administration, curriculum development, academic services, and educational evaluation, without abandoning the basic Islamic principles as the foundation of institutional management. Therefore, institutional changes in Islamic education require a leadership model that integrates modernization with religious values.

One relevant approach is Islamic value-based transformational leadership. Transformational leadership is a leadership style that emphasizes a leader's ability to build a shared vision, inspire, encourage innovation, and mobilize organizational members' commitment to achieve better outcomes. In the context of Islamic education, this model is not neutral but is grounded in Islamic values such as trustworthiness (*amanah*), exemplary behavior (*uswah*), consultation (*syura*), moral responsibility, and the pursuit of collective good. Integrating these values yields Islamic value-based transformational leadership, which focuses not only on organizational achievements but also on character development and spiritual responsibility. Ratnawati et al. [4] show that integrating transformational leadership with Islamic values can strengthen teachers' competency development in facing the challenges of the digital era.

Besides leadership, digital transformation is also closely related to a quality culture. Digital transformation can be understood as a strategic change process that leverages digital technology to enhance governance effectiveness, learning and innovation, and the quality of educational services. Meanwhile, quality culture is a set of values, norms, habits, and collective commitments that encourage all members of an organization to improve and achieve educational quality continuously. Saugi et al. [5] found that digital leadership contributes to building a quality culture through the use of technology, value-based leadership practices, and more directed decision-making. Zulkarnain [6] also emphasized that an organizational culture rooted in managerial values and Islamic moral principles affects management effectiveness, teacher performance, and the creation of a conducive learning environment. Therefore, the quality culture in Islamic educational institutions is

shaped not only by modern management systems but also by the religious values that permeate the organisation.

The connection between leadership, digital transformation, and quality culture is becoming increasingly important in Islamic boarding school-based Madrasah Aliyah. These Madrasah Aliyah are Islamic secondary education institutions that integrate the national curriculum with traditional pesantren education, serving as both academic institutions and centers for character development and the transmission of Islamic values. Compared to other educational levels, Madrasah Aliyah holds a strategic position because it prepares students for higher education and broader social life. At this level, the demand for 21st-century skills, digital literacy, and improved educational quality is growing, while the pesantren identity must still be maintained.

Previous studies generally show that transformational leadership improves organizational performance, that digital transformation enhances the effectiveness of educational services, and that a quality culture supports institutional quality improvement. However, most of these studies still examine these three aspects separately. Research in Islamic education also tends to focus on the implementation of digitalization, certain leadership models, and organizational culture. This pattern of findings indicates that the relationship among Islamic value-based transformational leadership, digital transformation, and quality culture has not been analyzed in an integrated way. Additionally, literature that specifically places Islamic senior high schools (Madrasah Aliyah) based on pesantren as a study context is still relatively limited. In fact, the institutional characteristics that combine formal education systems and pesantren traditions allow for the emergence of leadership dynamics and a quality culture distinct from those in general educational institutions.

Based on these conditions, there is a research gap: no comprehensive synthesis explains how Islamic values serve as the foundation for legitimizing transformational leadership in driving digital transformation and building a quality culture in pesantren-based Madrasah Aliyah. The novelty of this research lies in the effort to integrate three main dimensions, namely Islamic value-based transformational leadership, digital transformation, and quality culture, into a single conceptual framework focused on the context of pesantren-based Madrasah Aliyah through a Systematic Literature Review (SLR) approach. This approach allows for a more comprehensive understanding of the relationships between concepts that have so far been scattered across various studies.

Based on this background, this study aims to answer several review questions, namely: (1) how the development and trends of research on Islamic value-based transformational leadership in the context of digital transformation at pesantren-based Madrasah Aliyah; (2) how the relationship between Islamic value-based transformational leadership, digital transformation, and quality culture is described in the existing literature; and (3) what conceptual synthesis can explain the role of Islamic values as the foundation for organizational change and strengthening institutional quality at pesantren-based Madrasah Aliyah.

This study is expected to make a theoretical contribution by developing a conceptual framework that integrates Islamic value-based transformational leadership with digital transformation and quality culture in Islamic education. In practice, the research results can

serve as a reference for school principals, pesantren administrators, teachers, and policymakers in designing institutional transformation strategies that are adaptive to technological developments, without neglecting Islamic identity and values as the main foundation for improving educational quality.

2. METHOD

This research uses a Systematic Literature Review (SLR) approach to systematically identify, select, evaluate, and synthesize scientific publications on Islamic value-based transformational leadership, digital transformation, and quality culture in the context of Islamic education. The choice of SLR is driven by the need to organize findings that are scattered and fragmented into a more complete, transparent, and traceable synthesis. The reporting of this review is designed following the PRISMA 2020 guidelines [7].

A literature search was conducted in Scopus, Web of Science, ERIC, and ScienceDirect databases, with Google Scholar used selectively for additional tracking. The publication range was set from 2021 to 2026 to capture the most recent developments following the acceleration of educational digitalization in the post-pandemic period. The search strategy used a combination of keywords in English and Indonesian, including “transformational leadership”, “digital leadership”, “Islamic education”, “*madrasah*”, “pesantren”, “digital transformation”, “digitalization”, “quality culture”, and “budaya mutu”, connected with Boolean operators.

Inclusion criteria include: (1) articles published in the period 2021–2026; (2) articles originating from scientific journals or academic proceedings with adequate scientific quality; (3) articles discussing at least one of the following elements: transformational leadership, Islamic values, digital transformation, quality culture, madrasah, pesantren, or Islamic education management; (4) manuscripts available in full text; and (5) articles written in Indonesian or English. The exclusion criteria include duplicate articles, non-academic articles, articles that discuss learning technology without a clear relation to leadership or institutional governance, and articles that do not provide adequate methodological information or findings.

The article selection process follows the PRISMA flow, which includes identification, screening, eligibility, and inclusion. All articles identified in the initial stage were compiled, duplicates were removed, and titles and abstracts were examined to assess their initial suitability for the research focus. Articles that passed the screening were read in full to ensure alignment of theme, context, and information quality. In the final stage, ten core articles were designated as the basis for synthesis because they were most relevant to the review questions and provided findings that could be compared across contexts.

After the final articles were obtained, data extraction was carried out into an analysis matrix containing the author, year of publication, study context, research objectives, approach or method used, focus of the study, main findings, and remaining gaps. The quality assessment of the studies was conducted through an internal appraisal that evaluated the clarity of objectives, the suitability of the methods with the objectives, transparency of research procedures, strength of findings or arguments, and the relevance of the article to the review question.

The extracted data were then analyzed using thematic synthesis. In the initial stage, all the findings from the articles were read repeatedly to identify keywords, concepts, and recurring issue patterns. Next, initial coding was conducted, codes were grouped into categories, and major themes reflecting the literature's trends were developed. The synthesis was directed at the themes of Islamic values as a legitimacy for change, transformational leadership as a driver of digitalization, quality culture as a result of organizational habituation, and structural and cultural barriers to the transformation of madrasahs.

Table 1. Summary of research methodology design

Component	Research design
Types of research	Systematic Literature Review (SLR)
Reporting standards	PRISMA 2020
Database	Scopus, Web of Science, ERIC, ScienceDirect, and Google Scholar are limited.
Publication range	2021–2026
Language of the article	Indonesia and English
Topic focus	Transformational leadership, Islamic values, digital transformation, quality culture, madrasah/pesantren
Selection stage	Identification, screening, and eligibility were included.
Analysis technique	Thematic synthesis
Main output	Synthesis narrative, study characteristics table, thematic visualization, and conceptual model

3. RESULTS AND DISCUSSION

This results section is compiled from a Systematic Literature Review synthesis, so what is presented is not quotes from field informants but rather recurring patterns of findings from the studies most relevant to the intersection of transformational leadership, Islamic values, digital transformation, and quality culture in Islamic education. The synthesis focuses on 10 core articles published between 2023 and 2026 that are closest to the topic and include conceptual studies, science mapping, literature reviews, qualitative studies, mixed-method studies, and quantitative studies in the context of madrasahs, pesantrens, and Islamic educational institutions.

In general, the synthesis shows that the literature moves in a relatively consistent direction. First, digital transformation in Islamic educational institutions is not merely about the use of applications or devices, but about a governance change that demands vision, strategy, coordination, and the legitimacy of leadership. Second, transformational leadership is increasingly combined with Islamic values as a moral foundation to drive change. Third, quality culture emerges not as an automatic result of digitalization, but as a consequence of leadership that can transform work habits, communication, discipline, and institutional evaluation. Fourth, the main obstacles remain on the side of infrastructure, digital literacy, organizational maturity gaps, and cultural resistance.

Table 2. Characteristics of the studies synthesized

No	Author	Year	Method	Main focus
1	McCarthy et al. [1]	2023	Conceptual synthesis	Core components of educational digital transformation
2	Reis-Andersson [2]	2024	Survey and observation	Leaders' perception of digitalization
3	Wollscheid et al. [8]	2025	Science mapping	Trends in digital school leadership research
4	Azhari [3]	2024	Literature review	Digital-based transformation of Islamic education management
5	Ratnawati et al. [4]	2025	Qualitative case study	Transformational leadership based on Islamic values
6	Saugi et al. [5]	2025	Multi-site case study	Digital leadership and quality culture
7	Tabroni & Musyaffa [9]	2025	Mixed methods	Transformational leadership and administrative digitalization
8	Tantowi et al. [10]	2025	Mixed methods	The effectiveness of technology in administration and services
9	Wardi et al. [11]	2024	Descriptive qualitative	Digitization of pesantren financial systems
10	Zulkarnain [6]	2025	Literature review	Organizational culture is the foundation of management

3.1.Theme 1 — Islamic Values as a Source of Legitimacy for Leadership in Change

The first and most powerful theme is that Islamic values are present not merely as a label of institutional identity, but as a source of legitimacy for change. In the study by Ratnawati et al. [4], the leadership of madrasah principals is described through the integration of transformational elements with the values of *uswatun hasanah*, *shura*, and spiritual motivation. These findings indicate that the influence of leaders in madrasahs is built not only through vision and organizational control, but also through moral example, deliberation, and spiritual encouragement that give meaning to change.

The same direction is evident in the study by Saugi et al. [5], which shows that digital leadership in Islamic educational institutions becomes more effective when reinforced by values of trustworthiness, discipline, and ethical digital conduct. In the context of pesantren, Wardi et al. [11] also show that the institution's moral authority legitimizes the adoption of digital financial systems. Analytically, this theme shows that the literature on Islamic education management is beginning to shift from a pattern of values as ornament to one of values as a mechanism of change.

Visualization 1. Flow of legitimacy for changes based on literature synthesis

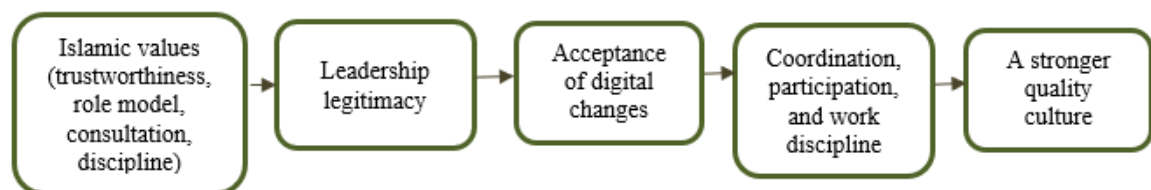


Figure 1. Flow of legitimacy for changes based on literature synthesis

Islamic values first strengthen the legitimacy of leaders, then facilitate the acceptance of digitalization, and ultimately support the formation of a culture of quality.

3.2. Theme 2 — Transformational leadership as the main driver of digital transformation

The second theme shows that transformational leadership is the most consistent driver of the digitalization process in Islamic educational institutions. McCarthy et al. [1] place digital transformation as a systemic change that requires interconnected leadership, strategy, and governance. Reis-Andersson [2] adds that leaders' perceptions of digitalization affect the quality of organizational arrangements, opportunities for quality improvement, and the expansion of technology use in schools.

In the context of madrasahs, Tabroni dan Musyaffa [9] found a strong relationship between transformational leadership and the success of administrative digitalization. Ratnawati et al. [4] reinforced this pattern from the perspective of teacher development: the integration of transformational leadership and Islamic values results in a teacher competency development model that includes needs-based programs, internal training, strengthening of MGMP, mentoring, classroom action research, technology integration, and comparative studies. From the synthesized literature, it is evident that transformational leadership operates through three pathways: vision of change, human resource empowerment, and organizational innovation.

Table 3. Thematic synthesis of research results

Theme	Dominant finding pattern	Representative study
Islamic values as legitimacy for change	Trustworthiness, role model, consultation, discipline, and digital ethics strengthen the acceptance of change.	Ratnawati et al.; Saugi et al.; Wardi et al.
Transformational leadership as a driver of digitalization	Vision, inspiration, intellectual stimulation, and empowerment drive the adoption of digital systems.	McCarthy et al.; Reis-Andersson; Tabroni & Musyaffa
Quality culture as a result of change	Digital leadership is effective when accompanied by monitoring, data, collaboration, and evaluation.	Saugi et al.; Zulkarnain; Tantowi et al.
Structural and cultural barriers	Infrastructure, digital literacy, institutional maturity disparities, and cultural resistance.	Tabroni & Musyaffa; Tantowi et al.; Wollscheid et al.

3.3. Theme 3 — A culture of quality grows when digitalization is translated into organizational habits

The third theme shows that a quality culture is not an automatic outcome of digitalization. Saugi et al. [5] demonstrate that digital leadership strengthens the quality culture when leaders use digital platforms for coordination, quality monitoring, instructional innovation, and data-driven decision making. Interestingly, this study also shows variations in maturity levels: higher education institutions and senior-level educational units appear to

be more mature in integrating digital leadership and quality culture compared to lower-level units.

These findings align with Zulkarnain [6], who positions organizational culture as the foundation of the effectiveness of madrasah educational management. In the context of pesantren, Tantowi et al. [10] indicate that the use of technology increases administrative efficiency, data processing speed, record accuracy, and the quality of educational services. However, for these benefits to be sustainable, institutions require training, policy support, and an adaptive organizational culture. Thus, technology becomes productive not because of the tool itself, but because there is an institutional process that transforms it into quality work habits.

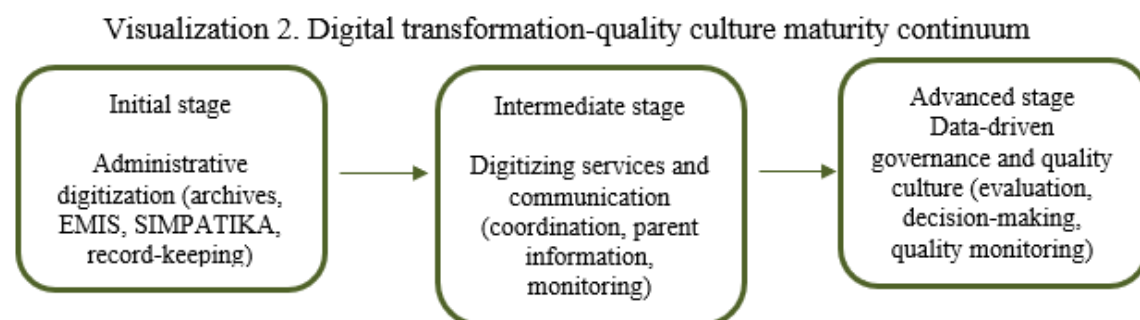


Figure 2. Continuum of digital transformation–quality culture maturity

A cross-study shows that digitalization in Islamic educational institutions usually moves from administration to services, and then to database-based governance that supports a quality culture.

3.4.Theme 4 — The main obstacles remain structural and cultural

The fourth theme shows that the literature is not romantic about digital transformation. Tabroni dan Musyaffa [9] emphasize that the implementation of digital administration in madrasahs remains uneven due to differences in infrastructure and digital literacy. Tantowi et al. [10] add the limitations of facilities, resistance to change, and the need for strengthening human resources. Azhari [3] also reminds us that digital-based Islamic education management transformation requires an innovative strategy that remains grounded in Islamic values.

Thus, the most dominant obstacles in this synthesis can be summarised as four: limitations in infrastructure and access, digital literacy gaps, disparities in organizational maturity across institutions, and cultural resistance. These four obstacles explain why digital transformation in Islamic educational institutions tends to be gradual and highly dependent on the quality of leadership.

Table 4. Dominant barriers and managerial implications

Dominant obstacle	Forms that appear in literature	Managerial implications
Limited infrastructure	Access to devices, networks, and systems is not yet evenly distributed.	Digitalization needs to be prioritized gradually and contextually.
Unequal digital literacy	Teachers and staff are not uniform in their readiness to use digital platforms.	Training, mentoring, and continuous professional learning are needed.
Organizational maturity varies	Certain institutions are more prepared to integrate data, monitoring, and quality evaluation.	Digitalization policies cannot be applied uniformly to all educational units.
Cultural resistance	There are concerns about changes in work patterns and the possible erosion of institutional traditions.	Changes must be legitimized through Islamic values, participatory communication, and the exemplary leadership of leaders.

If all the themes are read in an integrated manner, the results of this SLR reveal a larger pattern. Islamic values provide moral legitimacy, transformational leadership drives change, digitalization provides the instruments and systems, and a culture of quality emerges when the change is successfully institutionalized into work habits. This pattern explains that the success of digital transformation in madrasahs cannot be understood solely from a technological or leadership perspective; both must work together within an institutional culture coloured by Islamic values.

3.5.Discussion

The results of the Systematic Literature Review (SLR) show that Islamic value-based transformational leadership is a key driver of digital transformation and the development of a quality culture in Islamic senior high schools (Madrasah Aliyah) located in pesantrens. Unlike transformational leadership theory that emphasizes idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, this synthesis shows that in Islamic educational institutions, leadership effectiveness is also determined by the internalization of Islamic values such as trustworthiness (amanah), good role model (uswah hasanah), consultation (syura), and public interest (maslahah). Thus, Islamic values not only function as institutional identity but also as a source of moral legitimacy that strengthens acceptance of change [4] [5].

This finding also expands the concept of digital leadership. Previous literature explains that the success of digital transformation depends on the leader's vision, governance, and technology use [1], [2]. However, the synthesis results show that in pesantren-based Madrasah Aliyah, digitalization will be more effective if it is positioned as part of the institutional mandate and linked to Islamic values. That way, technology is not just seen as a tool for efficiency, but also as a means to improve the quality of educational services without losing the Islamic identity [3], [4].

Next, the research findings support the theory of organizational culture, which holds that a high-quality culture is formed through the institutionalization of organizational values and habits. Saugi et al. [5] and Zulkarnain [6] show that a quality culture develops when leadership, coordination, databased evaluation, and Islamic values work in an integrated

way. This shows that digital transformation does not automatically create a quality culture, but requires leadership that can internalize changes into the organization's work culture.

This synthesis also shows that several tensions arise in implementing digital transformation in Islamic senior high schools based on the pesantren model. First, digitalization must run in harmony with pesantren traditions so that technology becomes a complement, not a substitute, for pesantren values. Second, participative leadership needs to be developed without diminishing the moral authority of pesantren leaders through deliberation (*syura*) practices. Third, the efficiency orientation of technology must still be balanced with the main goal of Islamic education: the formation of students' character and spirituality. Fourth, digitalization should not stop at administration but should be directed toward transforming learning and improving teachers' competencies [3], [4], [9], [10], [11].

The conceptual model produced is particularly relevant for Islamic senior high schools (*Madrasah Aliyah*) based on pesantren, as it was developed from the characteristics of institutions that integrate formal education systems with pesantren traditions. Nonetheless, its principles could potentially be applied to other Islamic educational institutions, while still considering each organization's characteristics and level of digital readiness. Theoretically, this study offers novelty by integrating transformational leadership, digital transformation, quality culture, and Islamic values into a single conceptual framework. In practice, the research results emphasize that digitalization in *madrasahs* should be led as a cultural change agenda, supported by strengthening Islamic values, enhancing digital competence, fostering participatory communication, and continuous evaluation to produce a sustainable quality culture.

3.6. Research Limitations

This study has a few limitations. First, the synthesis is based on only ten core articles, so the results cannot yet be generalized to all Islamic educational institutions. Second, most studies come from the Indonesian context and are dominated by qualitative approaches. Therefore, future research needs to test this conceptual model through empirical studies at various levels of Islamic education and in different country contexts to achieve stronger validity.

4. CONCLUSION

Based on the results of the Systematic Literature Review (SLR), this study shows that digital transformation in Islamic senior high schools (*Madrasah Aliyah*) in pesantren settings is influenced by technology adoption, transformational leadership, moral legitimacy, human resource development, and organizational culture. This review proposes a conceptual model suggesting that Islamic values can legitimize transformational leadership, which, in turn, supports digital transformation and the institutionalization of a culture of quality. Therefore, digitalization is understood as an organizational change process that combines technological innovation with Islamic values.

Theoretically, this study enriches the study of transformational leadership by positioning Islamic values as a source of legitimacy for change in the context of Islamic education. In practice, the synthesis results indicate that the success of digital transformation

requires strengthening leadership capacity, improving teachers' and educational staff's digital literacy, and establishing a sustained, quality culture aligned with the characteristics of pesantren-based Madrasah Aliyah. This study has limitations because it is based on the synthesis of ten articles that met the inclusion criteria, so the findings are not yet empirical evidence from field testing. Therefore, future research is recommended to empirically test this conceptual model in Islamic high schools, including pesantrens, as well as other Islamic educational institutions, to validate the relationships among transformational leadership, Islamic values, digital transformation, and quality culture in a broader context.

REFERENCES

- [1] A. M. McCarthy, D. Maor, A. Mcconney, and C. Cavanaugh, "Digital transformation in education: Critical components for leaders of system change," *Soc. Sci. Humanit. Open*, vol. 8, no. 1, pp. 1–15, 2023, doi: 10.1016/j.ssaho.2023.100479.
 - [2] J. Reis-Andersson, "Leaders' perceptions of digitalisation in K–12 education: influencing arrangements for leading the expansion of digital technologies," *Discov. Educ.*, vol. 3, no. 143, pp. 1–17, 2024, doi: 10.1007/s44217-024-00247-y.
 - [3] M. Azhari, "The Transformation of Islamic Education Management Based on Digitalization: Innovative Strategies Toward Globally Competitive Educational Institutions," *Int. J. Manag. Islam. Educ.*, vol. 2, no. 1, pp. 31–40, 2024, [Online]. Available: <https://jurnal.uinsu.ac.id/index.php/IJMIE/article/view/24098>
 - [4] R. Ratnawati, M. Nursalim, and A. Khamidi, "Transformational Leadership of Madrasah Principals Based on Islamic Values: An Integrative Model for Teacher Competency Development in the Digital Era," *J. Reflektika*, vol. 20, no. 1, pp. 31–55, 2025, doi: 10.28944/reflektika.v20i1.2077.
 - [5] W. Saugi, Purwoko, Azainil, D. Nugroho, and M. R. Buhari, "Digital Leadership and Quality Culture in Islamic Educational Institutions : A Multi-Level Empirical Study," *Southeast Asian J. Islam. Educ.*, vol. 08, no. 02, pp. 213–231, 2025, doi: 10.21093/sajie.v8i2.12023.
 - [6] Zulkarnain, "Madrasah Organizational Culture as the Foundation for Effective Educational Management," *J. Sustain.*, vol. 8, no. 2, pp. 155–163, 2025, doi: 10.32923/afy3wp14 Madrasah.
 - [7] M. J. Page *et al.*, "The PRISMA 2020 statement : an updated guideline for reporting systematic reviews Systematic reviews," *BMJ*, vol. 372, no. 71, pp. 1–9, 2021, doi: 10.1136/bmj.n71.
 - [8] S. Wollscheid, C. E. Tomte, G. C. Egeberg, H. Karlstrom, and L. W. Fossum, "Research trends on digital school leadership over time: Science mapping and content analysis," *Educ. Inf. Technol.*, vol. 30, no. 1, pp. 747–778, 2025, doi: 10.1007/s10639-024-12909-3.
 - [9] Tabroni and A. A. Musyaffa, "The Digitization of Madrasah Administration: Relationship between Transformational Leadership and Technology Implementation in Jambi," *Al-Ishlah J. Pendidik.*, vol. 17, no. 4, pp. 5846–5857, 2025, doi: 10.35445/alishlah.v17i4.8880.
 - [10] A. Tantowi, M. A. Gunawan, and A. Ibrahim, "Optimizing Islamic Boarding School Management in the Digital Era: Analysis of Technology Effectiveness in Administration and Operations," *Munaddhomah J. Manaj. Pendidik. Islam*, vol. 6, no. 2, pp. 295–309, 2025, doi: 10.31538/munaddhomah.v6i2.1738.
 - [11] M. Wardi *et al.*, "Digital Transformation of Islamic Boarding School Financial System; Formulation, Implementation and Evaluation," *Munaddhomah J. Manaj. Pendidik. Islam*, vol. 5, no. 4, pp. 461–482, 2024, doi: 10.31538/munaddhomah.v5i4.1388.
-