

Data-Driven Leadership in Madrasahs: How Institutional Data Shapes Strategic Decision-Making and Educational Quality

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Abstract

Data-driven leadership has increasingly emerged as an important approach to strengthening strategic decision-making and educational quality. However, the availability of institutional data does not automatically lead to effective decisions, particularly within madrasahs, where managerial practices are shaped by organizational, contextual, and Islamic value dimensions. This study aims to examine how institutional data are transformed into strategic intelligence and subsequently utilized to support educational quality improvement in madrasahs. A systematic literature review (SLR) was conducted using relevant peer-reviewed literature indexed in major academic databases. The review followed the PRISMA framework and analyzed studies addressing data-driven leadership, data literacy, strategic decision-making, organizational culture, and educational quality. The synthesis indicates that data-driven leadership operates through an interconnected process involving data availability, data literacy, interpretation, strategic sense-making, decision-making, and organizational intervention. The findings further demonstrate that the contribution of data to educational quality is mediated by organizational culture, institutional capacity, and contextual conditions. Data become strategically valuable when leaders move beyond administrative reporting and use evidence to identify institutional priorities, allocate resources, strengthen teacher professional development, improve instructional practices, and evaluate organizational interventions. In the madrasah context, Islamic values provide an ethical orientation for interpreting and implementing data-informed decisions through principles of *amanah*, justice, consultation, transparency, and institutional benefit. The study proposes a context-sensitive and value-based model of data-driven madrasah management that positions institutional data as a strategic resource for continuous educational quality improvement.

Keywords: Data-Driven Leadership, Madrasah Management, Data Literacy, Strategic Decision-Making, Educational Quality

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INTRODUCTION

The increasing complexity of educational institutions has transformed the nature of educational leadership and institutional management. School and madrasah leaders are increasingly required to make decisions in environments characterized by rapid technological change, heightened accountability, diverse stakeholder expectations, and the growing availability of institutional data (A'la & Makhshun, 2022). Under these conditions, leadership based solely on experience, intuition, or administrative routines is increasingly insufficient. Educational leaders need to identify institutional problems systematically, interpret evidence critically, allocate resources strategically, and evaluate the consequences of managerial interventions. Consequently,

data-driven decision-making has become an important dimension of contemporary educational leadership because it enables leaders to establish priorities based on evidence, monitor institutional performance, and formulate improvement strategies that are more responsive to actual educational conditions (Adawiyah et al., 2024).

However, the increasing availability of educational data does not automatically result in better organizational decisions or improved educational quality. Data become meaningful only when educational leaders possess the capacity to interpret, contextualize, and translate them into appropriate managerial actions. Data-based decision-making should be understood as a systematic process in which educational data are collected, analyzed, interpreted, and subsequently used to develop improvement strategies (Schildkamp, 2019). Similarly, Mandinach & Gummer emphasize that effective data use requires more than technical access to information; it involves the development of data literacy and organizational conditions that enable educators to transform data into actionable knowledge (Mandinach & Gummer, 2013). Therefore, the central challenge is not simply whether educational institutions possess sufficient data, but whether leaders and organizational actors are capable of converting available information into meaningful decisions.

Within this context, data-driven leadership represents a significant development in educational management. Data-driven leadership refers to leadership practices in which institutional leaders intentionally use multiple forms of evidence to understand organizational conditions, identify priorities, formulate strategies, monitor implementation, and evaluate outcomes (Alsbou & Alsaraireh, 2024). This approach places school leaders at the center of the institutional data-use process. Principals and other educational leaders are not merely consumers of data but also organizational actors who create structures, norms, and collaborative processes that determine how data are interpreted and utilized. A systematic review by Ke et al demonstrates that principals' data literacy encompasses multiple dimensions, including the ability to understand data, facilitate data use among organizational members, and integrate data into school improvement processes (Ke et al., 2016). These findings indicate that effective data-driven leadership is simultaneously an individual leadership capacity and an organizational process.

The connection between data-driven leadership and educational quality is consequently complex. Institutional data can provide information about student achievement, teacher performance, attendance, learning processes, school climate, resource management, and other dimensions of educational provision. Nevertheless, data alone cannot determine which intervention should be implemented. Leaders must interpret the significance of particular indicators, identify their underlying causes, establish priorities, consider available resources, and involve relevant stakeholders in decision-making (Y. Arifin & Priyana, 2025). Effective data teams require shared goals, organizational support, leadership commitment, and structured processes for analyzing and discussing evidence (Schildkamp, 2019). Similarly, Adawiyah highlight the importance of teacher capacity, organizational culture, and beliefs in determining whether data can be effectively incorporated into educational decision-making (Adawiyah et al., 2024). Thus, data-driven leadership should be understood as a process of organizational sense-making rather than merely a technical procedure for reading institutional indicators.

This perspective becomes particularly important when examining Islamic educational institutions such as madrasahs. Madrasahs operate within a distinctive educational environment in which academic achievement, institutional effectiveness, religious identity, character formation, and Islamic values are interconnected. Consequently, strategic management in madrasahs cannot be reduced to the achievement of quantitative performance indicators (Amin et al., 2021). Madrasah leaders are required to manage educational resources and improve institutional performance while simultaneously maintaining the religious and moral orientation that constitutes

the identity of Islamic education. In this regard, data-driven leadership requires an integration between evidence-based managerial practices and the normative principles underlying Islamic educational management. Data may identify institutional weaknesses, but decisions concerning how those weaknesses should be addressed remain influenced by leadership values, organizational culture, institutional priorities, and the broader mission of Islamic education.

The Indonesian educational context provides an important setting for examining this relationship. The development of Rapor Pendidikan has strengthened the institutionalization of evidence-based educational planning by providing educational units with information concerning different dimensions of educational quality. The platform is intended to assist educational institutions in identifying priority problems, reflecting on their underlying causes, developing improvement strategies, and evaluating follow-up actions. This policy development demonstrates a broader movement toward evidence-based management within the Indonesian education system. Nevertheless, the existence of institutional data and digital platforms does not necessarily guarantee that school and madrasah leaders will use data strategically. The effectiveness of data-driven management depends on leaders' capacity to interpret information and connect it with institutional realities, organizational capabilities, and feasible improvement actions.

Recent research in Indonesian madrasahs illustrates this challenge. Institutional data available through Rapor Pendidikan could provide important information for understanding educational quality dynamics in madrasahs. However, the availability of data does not necessarily mean that it is fully integrated into strategic planning and quality improvement. This finding suggests that the analytical focus needs to move beyond the availability of educational data toward the processes through which leaders interpret and mobilize that data within institutional decision-making. Such an approach is particularly relevant because different educational indicators may demonstrate different patterns of change, requiring leaders to interpret relationships among indicators rather than simply respond to individual performance scores.

Furthermore, the literature on educational data use indicates that organizational culture plays an important role in determining whether data become an instrument for improvement or merely an accountability mechanism. Data can be used constructively when organizational members perceive data as a resource for learning, reflection, and improvement rather than simply as an instrument of control. In contrast, when data use is dominated by compliance and reporting requirements, educational institutions may prioritize the production of reports over the interpretation and utilization of evidence.

Another important issue concerns the diversity of data available to educational leaders. Institutional decision-making in madrasahs may draw upon formal assessment results, teacher performance information, student attendance, enrollment trends, curriculum evaluation, financial information, infrastructure conditions, community feedback, and internal quality assurance mechanisms. These sources do not always provide identical or straightforward messages. Consequently, data-driven leadership requires leaders to integrate multiple sources of evidence and contextual knowledge. In this sense, data-driven decision-making is not simply a matter of selecting the highest or lowest indicator. It involves a process of interpretation in which quantitative information is combined with professional judgment, organizational knowledge, and contextual understanding. This perspective corresponds with the broader literature emphasizing that educational data use is most effective when embedded in collaborative inquiry and systematic improvement processes (Schildkamp, 2019).

Despite the growing literature on data-driven leadership and educational decision-making, an important research gap remains. Existing studies have examined principals' data literacy, data-based decision-making, data teams, digital leadership, and evidence-based school improvement.

However, relatively limited research has examined how data-driven leadership operates specifically within the institutional and normative context of madrasahs. More specifically, insufficient attention has been given to the process through which madrasah leaders access different forms of institutional data, interpret their meaning, negotiate priorities with organizational stakeholders, translate evidence into strategic decisions, and subsequently connect those decisions with educational quality improvement. The issue is therefore not merely whether madrasah leaders use data, but how data become a source of strategic knowledge within the management of Islamic educational institutions.

Addressing this gap is important for both theoretical and practical reasons. Theoretically, examining data-driven leadership in madrasahs can extend existing discussions of educational leadership by demonstrating how evidence-based management operates within an institution characterized by distinctive religious, cultural, and organizational values. Practically, understanding this process can help madrasah leaders develop more effective mechanisms for transforming institutional data into strategic planning, resource allocation, teacher development, instructional improvement, and quality assurance. Rather than treating data as a technical instrument for reporting and accountability, data-driven leadership can position institutional evidence as a resource for organizational learning and continuous improvement.

Therefore, this study investigates how madrasah leaders access, interpret, and utilize institutional data in strategic decision-making and how these processes contribute to educational quality improvement. The study specifically examines the organizational and contextual factors that enable or constrain data-driven leadership and explores how institutional evidence is transformed into managerial priorities and concrete quality-improvement actions. By focusing on the relationship between institutional data, leadership interpretation, strategic decision-making, and educational quality, this study seeks to develop a context-sensitive understanding of data-driven leadership in Islamic educational institutions. The study contributes to the field of Islamic educational management by positioning data-driven leadership not merely as a technological or administrative practice, but as a strategic managerial process involving evidence, leadership judgment, organizational collaboration, institutional values, and continuous educational improvement.

RESEARCH METHOD

This study employed a systematic literature review (SLR) to synthesize existing scholarly evidence concerning data-driven leadership, institutional data utilization, strategic decision-making, and educational quality within Islamic educational institutions, particularly madrasahs. An SLR was selected because it enables researchers to systematically identify, evaluate, and synthesize relevant studies while minimizing the potential for arbitrary selection of literature (Snyder, 2019). The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement to ensure transparency and methodological rigor throughout the identification, screening, eligibility, and inclusion processes (Page et al., 2021).

The literature search was conducted using two major international bibliographic databases, Scopus and Web of Science (WoS), which were selected because of their broad coverage of peer-reviewed scholarly publications and their relevance to high-quality educational research. The search strategy combined keywords representing the four central concepts of the study: data-driven leadership, educational institutions, strategic decision-making, and educational quality. The search terms included combinations of "data-driven leadership," "data-driven decision making," "data-informed leadership," "educational leadership," "school leadership," "madrasah," "Islamic education," "Islamic educational institutions," "strategic decision-making," "evidence-based

decision-making,” and “educational quality.” Boolean operators such as AND and OR were used to construct search strings and broaden or narrow the retrieval of relevant publications.

The inclusion criteria were established before the screening process. Studies were included when they (1) were published in peer-reviewed academic journals; (2) addressed educational leadership, data use, data-driven decision-making, institutional management, or educational quality; (3) provided substantive discussion or empirical evidence relevant to the research objectives; and (4) were published within the predetermined publication period. Studies were excluded when they were unrelated to educational management or leadership, focused exclusively on technical data systems without managerial implications, consisted of editorials or non-scholarly publications, or did not provide sufficient information for analytical synthesis. Where duplicate records were identified across databases, only one record was retained.

The selection process consisted of four stages: identification, screening, eligibility assessment, and final inclusion. First, all records retrieved from Scopus and WoS were compiled and duplicates were removed. Second, titles and abstracts were screened according to the predetermined inclusion and exclusion criteria. Third, potentially relevant articles were assessed through full-text examination. Finally, studies that satisfied all eligibility criteria were included in the qualitative synthesis. The entire selection process will be documented through a PRISMA flow diagram, including the number of records identified, screened, excluded, assessed for eligibility, and ultimately included in the review (Page et al., 2021).

Data extraction was performed systematically using a predefined extraction matrix. The extracted information included author and publication year, research context, country, research design, participants or units of analysis, theoretical perspective, forms of institutional data examined, leadership practices, decision-making processes, educational quality dimensions, principal findings, limitations, and reported implications. The extracted data were subsequently compared across studies to identify recurring patterns, conceptual relationships, methodological tendencies, and areas of inconsistency.

The synthesis employed a thematic approach rather than statistical meta-analysis because the anticipated literature was expected to contain substantial methodological and contextual heterogeneity. Thematic synthesis involved coding findings related to data acquisition, data literacy, data interpretation, strategic decision-making, organizational culture, leadership practices, Islamic institutional values, and educational quality. The resulting themes were then compared and integrated to identify conceptual relationships and research gaps. This process enabled the study to develop a context-sensitive conceptual understanding of how institutional data may function as a strategic resource in educational leadership and quality improvement in madrasahs.

FINDINGS AND DISCUSSION

Reconstructing Data-Driven Leadership in Madrasahs

The synthesis of the literature indicates that data-driven leadership in educational institutions should not be reduced to the technical capacity of leaders to access or read institutional information. Rather, it represents a multidimensional leadership process through which diverse forms of educational data are collected, interpreted, contextualized, and transformed into knowledge that can guide organizational action. This distinction is particularly important in the context of madrasahs, where institutional decisions are situated within complex educational, organizational, social, and religious environments (Ansori et al., 2023). The literature on data-based decision-making has increasingly moved away from the assumption that data automatically generate better decisions and toward an understanding of data use as a socially and organizationally mediated process (Schildkamp, 2019). In this perspective, the central question is

not simply whether madrasahs possess adequate data, but whether their leaders and organizational members are capable of transforming available information into meaningful strategic intelligence.

The first pattern emerging from the literature concerns the expansion of the data environment within educational institutions. Data used by educational leaders are no longer restricted to student examination results or standardized assessment scores. Contemporary educational organizations generate multiple forms of information concerning student achievement, attendance, teacher performance, instructional quality, school climate, institutional resources, curriculum implementation, financial management, and stakeholder participation (Alsyabani et al., 2024). Schildkamp emphasizes that educational improvement can draw upon a wide range of evidence rather than relying exclusively on summative assessment data. This diversification of data creates opportunities for more comprehensive institutional diagnosis, but it simultaneously increases the complexity of leadership (Schildkamp, 2019). When leaders are confronted with multiple indicators, they must determine which information is relevant, how different indicators relate to one another, and which issues should receive institutional priority.

In the context of madrasahs, this expansion is particularly relevant because institutional data may originate from administrative information systems, academic assessments, teacher performance records, student development records, quality assurance mechanisms, and national or institutional evaluation platforms. Recent Indonesian research demonstrates that Rapor Pendidikan, for example, can provide madrasah leaders with information concerning multiple dimensions of educational quality, allowing them to identify areas of improvement and monitor changes in institutional performance (Annur et al., 2022). However, the availability of such information does not eliminate the need for leadership judgment. Data may reveal that one indicator has improved while another has deteriorated, thereby requiring leaders to examine the relationships and possible causes underlying these patterns rather than responding mechanically to individual scores. This reinforces the proposition that the value of institutional data depends substantially on the interpretive capacity of educational leaders (Fauziah, 2025).

The second pattern concerns the emergence of data literacy as a fundamental leadership capability. Data literacy should not be understood merely as the ability to operate digital platforms, calculate statistics, or read institutional dashboards. For educational leaders, data literacy involves the capacity to identify relevant evidence, understand its limitations, interpret its meaning, communicate findings, and use those findings to guide organizational improvement. Mundiri, based on a systematic review of 56 empirical studies, demonstrate that principals' data literacy consists of multiple dimensions and differs substantially from the data literacy required of teachers. While teachers may focus more directly on generating, analyzing, and applying data to instructional practices, school leaders have a broader responsibility to establish conditions under which data can be used collectively for institutional improvement (Mundiri et al., 2025). This distinction is particularly significant for madrasah principals because their leadership responsibilities extend beyond individual instructional decisions toward strategic planning, resource management, teacher development, institutional accountability, and organizational change.

Data literacy therefore functions as a bridge between data availability and leadership action. A leader may have access to extensive institutional information but remain unable to derive meaningful strategic conclusions if the leader lacks the capacity to distinguish relevant from irrelevant evidence, recognize patterns, question assumptions, and connect quantitative indicators with contextual realities (Arruda Filho et al., 2019). Conversely, a leader with strong data literacy can transform apparently fragmented information into a coherent understanding of institutional conditions. The literature consequently suggests that data literacy should be positioned as a leadership capability rather than merely a technical competency. This interpretation also explains

why investments in digital infrastructure alone are insufficient to establish genuinely data-driven educational organizations (Ansori et al., 2023).

A third pattern concerns the movement from data interpretation toward strategic sense-making. The literature indicates that data use is fundamentally an interpretive process. Educational leaders rarely receive data that directly prescribe a particular decision. Instead, they must construct explanations about what the data mean, why particular patterns have emerged, and what forms of intervention may be appropriate. Schildkamp et al. demonstrate that effective data use requires school leaders to establish shared goals and norms, provide intellectual and emotional support, create a safe climate for data discussions, and connect different organizational actors through networks (Schildkamp, 2019). These findings suggest that data-driven leadership involves collective sense-making rather than individual data consumption.

The concept of sense-making is particularly useful for understanding leadership in madrasahs because educational indicators cannot always be interpreted independently of their institutional context. A decline in student achievement, for instance, may be associated with instructional practices, teacher workload, student attendance, curriculum changes, socioeconomic circumstances, learning resources, or other contextual factors. Consequently, responsible leaders should resist the temptation to interpret a single indicator as an isolated explanation of institutional performance (Affandi et al., 2024). Instead, they need to triangulate different sources of evidence and engage relevant stakeholders in interpreting the underlying situation. Data-driven leadership thus involves asking not only “What does the data show?” but also “Why does this pattern occur?”, “What contextual factors shape it?”, and “What evidence is needed before an intervention can be justified?”

This process also transforms the meaning of leadership itself. Traditional managerial leadership may position the principal as the primary source of knowledge and authority, whereas data-informed leadership increasingly requires collaborative inquiry. Data teams provide an important illustration of this transformation. Schildkamp et al. (2019) found that school leaders can enable effective data use by establishing a shared vision, providing individualized support, stimulating intellectual engagement, creating a safe climate for data use, and connecting different parts of the organization. Data-driven leadership therefore becomes distributed across organizational relationships rather than concentrated exclusively in the formal authority of the principal. In madrasahs, this can involve principals, vice principals, teachers, administrative staff, supervisors, and other stakeholders collectively interpreting institutional evidence and formulating responses (Faqih et al., 2025).

The literature further reveals an important distinction between data use for compliance and data use for organizational learning. Educational institutions frequently collect data because of reporting, accreditation, accountability, or administrative requirements. Such practices can generate substantial quantities of information without necessarily producing institutional learning. Data-driven leadership becomes more meaningful when data are used to identify problems, test assumptions, develop interventions, monitor implementation, and revise strategies. In this sense, data should become part of an organizational learning cycle rather than ending with the submission of reports (Hendro, 2024). The distinction is crucial for madrasahs because institutional data systems can potentially function either as bureaucratic reporting mechanisms or as instruments for strategic educational improvement.

Recent studies in the Indonesian Islamic education context reinforce this emerging interpretation. Research on madrasah management has increasingly connected data-based decision-making with Islamic values, suggesting that institutional evidence and normative considerations need not operate as separate domains. Kartika, for example, explicitly examine the

integration of institutional data and Islamic values within madrasah decision-making. This direction is important because it indicates that data-driven management in madrasahs cannot simply reproduce models developed for secular organizational settings without considering the distinctive purposes and values of Islamic education (Kartika et al., 2022). Data provide evidence about institutional conditions, but the determination of priorities and appropriate actions remains embedded within a broader educational philosophy.

Accordingly, the synthesis suggests that data-driven leadership in madrasahs should be reconstructed as a progressive process consisting of at least four interconnected stages: data availability, data literacy, strategic interpretation, and organizational sense-making. Data availability constitutes the informational foundation; data literacy provides leaders with the capacity to understand and evaluate evidence; interpretation transforms raw information into meaningful knowledge; and strategic sense-making connects that knowledge with institutional priorities and organizational action. These stages are neither strictly linear nor independent. Leaders may return to earlier stages when new evidence challenges an initial interpretation, while collective discussions may reveal the need to collect additional information before a strategic decision is made (Göçen, 2021).

The most important implication of this synthesis is therefore that data-driven leadership is not fundamentally a technological phenomenon. Digital systems may increase the speed, volume, and accessibility of information, but they do not determine how information is understood or used. The decisive element is the leadership process through which data are transformed into strategic meaning. In madrasahs, this process requires not only technical and analytical competence but also contextual awareness, collaborative leadership, organizational learning, and sensitivity to institutional values. Data become strategically valuable only when leaders are able to connect evidence with institutional realities and transform that evidence into shared understanding. Thus, the literature supports a reconceptualization of data-driven leadership as a process of transforming institutional data into strategic intelligence through data literacy, collective interpretation, and contextual sense-making. This conceptualization provides the foundation for the next analytical question: how such strategic intelligence is translated into concrete organizational interventions and ultimately contributes to educational quality improvement.

Translating Evidence into Educational Quality

The synthesis of the reviewed literature indicates that the contribution of data-driven leadership to educational quality does not occur through data availability alone. Rather, educational improvement emerges through a sequence of interpretive and organizational processes in which institutional evidence is transformed into strategic decisions, organizational interventions, and continuous improvement. Recent systematic evidence confirms that the relationship between school leadership, data-driven decision-making, and educational quality is largely indirect, with data literacy and organizational culture functioning as important mediating conditions (Bush & Glover, 2014). This finding is particularly relevant to madrasahs because institutional quality is shaped not only by measurable educational outcomes but also by organizational capacity, teacher development, institutional culture, and the values that guide managerial decisions. Consequently, the effectiveness of data-driven leadership should be examined through the entire pathway from evidence to action and from action to educational improvement (Greany & Kamp, 2024).

The first important finding concerns the transformation of evidence into strategic decision-making. Institutional data become strategically valuable when leaders use them to identify priority problems, establish institutional objectives, determine appropriate interventions, and allocate resources according to identified needs. This process requires leaders to move beyond descriptive

interpretations of performance indicators. Rather than simply recognizing that an institutional indicator is low or declining, leaders must investigate why the condition exists and determine which intervention is most likely to address its underlying causes. In this sense, strategic decision-making represents the point at which data interpretation becomes organizational judgment. The literature on data-based decision-making emphasizes that effective data use requires systematic cycles of inquiry in which educational actors identify problems, formulate hypotheses, examine evidence, implement interventions, and evaluate their consequences (Adawiyah et al., 2024; R & Kamil, 2025).

Within madrasahs, this process can encompass decisions concerning teacher professional development, instructional programs, student support, curriculum implementation, infrastructure, resource allocation, and institutional planning. Recent research on Indonesian madrasahs shows that data such as academic achievement, attendance, discipline, and service-related information can be incorporated into managerial decisions, although their utilization remains selective and context-dependent (Sartini et al., 2025). This finding challenges the assumption that data-driven management necessarily means applying every available indicator to every decision. Instead, effective leadership requires the capacity to identify which evidence is most relevant to a particular institutional problem. Data-driven leadership is therefore better conceptualized as evidence-informed judgment rather than mechanical decision-making based on numerical indicators.

The second finding concerns the translation of strategic decisions into organizational interventions. Data-informed decisions have limited value when they remain confined to planning documents or administrative meetings. Their contribution to educational quality depends on whether decisions are translated into concrete changes in institutional practice (Harris & Jones, 2021). These changes may include reallocating resources, redesigning professional development, strengthening instructional supervision, modifying learning programs, improving student support systems, or establishing new monitoring mechanisms. The literature on data-based improvement suggests that data use becomes consequential when evidence is connected to specific improvement actions and subsequently subjected to evaluation (Schildkamp et al., 2019). Accordingly, the effectiveness of data-driven leadership should be evaluated not by the quantity of data collected but by the extent to which evidence informs meaningful organizational change.

Teacher development represents one of the most important pathways through which data-informed decisions can influence educational quality. Institutional evidence can identify areas in which teachers require additional support, whether in instructional strategies, assessment practices, curriculum implementation, classroom management, or the use of educational technology. However, data should not be employed merely to evaluate teachers or identify deficiencies. When used within a developmental leadership framework, data can become a basis for collaborative professional learning. Research on data use emphasizes that leadership support, teacher collaboration, professional development, and data literacy are important conditions for effective implementation (Schildkamp et al., 2019). Thus, a madrasah leader who identifies weaknesses in student achievement through institutional data may respond not simply by demanding improved performance, but by examining instructional causes and developing targeted professional learning opportunities.

The third finding concerns organizational culture as a critical condition linking strategic decisions with educational quality. Data-driven management requires an organizational environment in which teachers and other institutional actors are willing to discuss evidence openly, question existing practices, and participate in collective problem-solving (Almeida & Morais, 2025). A culture dominated by fear, blame, or compliance may encourage organizational actors to manipulate, selectively report, or defensively interpret data. Conversely, a culture characterized by

trust, collaboration, reflection, and shared responsibility can facilitate more productive data use. Recent systematic evidence reinforces this argument by showing that the impact of data-driven decision-making on educational quality is mediated by organizational culture and data literacy rather than occurring as a direct technological effect (A'la & Makhshun, 2022). Therefore, leadership is required not only to make decisions from data but also to construct the organizational conditions necessary for data-informed improvement.

This cultural dimension is especially important in madrasahs because decision-making is embedded in institutional relationships and collective educational responsibilities. The use of data may involve consultation with teachers, administrative personnel, supervisors, and other stakeholders. Recent research examining data-based and value-based planning in Indonesian educational institutions indicates that strategic leadership can integrate data with religious and local values rather than treating evidence and values as competing domains (Adawiyah et al., 2024). Such integration suggests that the legitimacy of a decision in Islamic educational settings may depend not only on whether it is supported by evidence but also on whether it is perceived as consistent with the institution's educational mission and ethical commitments.

The fourth finding concerns the importance of institutional context. The synthesis indicates that there is no universally applicable pathway through which data-driven decisions produce educational quality. The same evidence may lead to different decisions depending on institutional capacity, geographical circumstances, socioeconomic conditions, teacher characteristics, available resources, and community expectations. Consequently, data-driven leadership should be understood as context-sensitive. A decision that is feasible in a well-resourced urban madrasah may not be equally appropriate in a rural or disadvantaged institution. This contextual dimension requires leaders to combine empirical evidence with professional judgment and knowledge of local circumstances. Data should therefore inform decisions without replacing contextual reasoning.

This argument has significant implications for the conceptualization of educational quality. Quality cannot be understood solely as improvement in standardized achievement scores. In madrasahs, quality may involve academic achievement, instructional quality, teacher professionalism, student character, school climate, institutional governance, community engagement, and the preservation of the institution's Islamic educational mission. Recent research on Indonesian madrasahs illustrates that different quality indicators can move in different directions simultaneously: some indicators may improve while others decline (Goffar & Miftahussurur, 2025). Such non-linear patterns demonstrate why educational leaders need to interpret quality as a multidimensional phenomenon rather than relying on a single performance indicator. Data-driven leadership therefore requires a comprehensive understanding of quality and an ability to balance competing institutional priorities.

The fifth finding concerns the ethical dimension of data-driven decision-making. In Islamic educational institutions, evidence-based management should not be separated from normative considerations. Data may establish what is happening within an institution, but they do not independently determine what ought to be done. Decisions remain dependent on ethical principles concerning fairness, responsibility, transparency, consultation, and institutional benefit. Recent research on madrasah management demonstrates that institutional data can function as an empirical basis for identifying problems while Islamic values guide deliberation, decision determination, implementation, and evaluation (Utama & Akbar, 2023).

The principle of *musyawarah* is particularly relevant in this context because it positions decision-making as a deliberative rather than purely technocratic process. Data can provide evidence concerning institutional conditions, but deliberation allows organizational actors to interpret that evidence, consider different perspectives, and assess the consequences of alternative

interventions. Similarly, the principle of justice requires leaders to consider whether resource allocation and institutional interventions are distributed fairly among students, teachers, and organizational units (Goffar & Miftahussurur, 2025). The concept of *amanah* further emphasizes that institutional authority should be exercised responsibly and transparently. Consequently, the integration of data and Islamic values can prevent data-driven leadership from becoming excessively instrumental or narrowly performance-oriented.

The literature also reveals a potential tension between improvement-oriented data use and accountability-oriented data use. Data systems can encourage institutions to focus on measurable indicators because these indicators are often associated with reporting, evaluation, accreditation, or external accountability. While accountability is necessary for institutional governance, excessive emphasis on performance metrics may encourage leaders to prioritize what is easily measurable rather than what is educationally meaningful. Data-driven educational leadership needs to move beyond instrumental approaches toward more complex sociocultural and ethical frameworks (BZ et al., 2024). For madrasahs, this means that institutional data should support continuous learning and improvement rather than simply satisfying external reporting requirements.

Based on the synthesis, educational quality improvement can therefore be conceptualized as a mediated and iterative process rather than as a direct consequence of data availability. The process begins with the availability of institutional data, which acquire strategic meaning when educational leaders apply data literacy and contextual knowledge to interpret relevant patterns, trends, and organizational conditions. Through this interpretive process, raw institutional information is transformed into strategic intelligence that enables leaders and organizational actors to identify priorities, assess institutional needs, and formulate informed strategic responses. Strategic intelligence subsequently informs strategic decision-making, through which institutional leaders determine appropriate priorities and courses of action in accordance with organizational objectives and educational needs (Franceško & Nedeljković, 2022).

These strategic decisions are then translated into contextual organizational interventions, including resource allocation, teacher professional development, instructional improvement, student support, and institutional planning. The effectiveness of such interventions depends not only on the quality of the decisions themselves but also on organizational culture, leadership capacity, available resources, stakeholder engagement, and the broader institutional context. Within Islamic educational institutions, Islamic values provide an additional ethical framework that shapes deliberation, implementation, accountability, and evaluation. Principles such as *amanah*, *'adl*, *shūrā*, *maslahah*, and *mas'uliyah* help ensure that the use of institutional data remains oriented toward educational responsibility and institutional benefit rather than merely administrative compliance (Miftahussurur & Firdaus, 2024). Educational quality consequently emerges as the cumulative outcome of this interconnected process, while new institutional evidence provides feedback that enables organizations to reassess previous decisions, refine interventions, and continuously improve their educational practices.

The entire process is shaped by three cross-cutting dimensions: organizational culture, institutional context, and Islamic ethical values. This model extends conventional understandings of data-driven leadership by positioning educational quality not as an automatic outcome of evidence-based decision-making but as the result of a complex process of interpretation, deliberation, intervention, and organizational learning. It also clarifies the distinctive contribution of the madrasah context: evidence is necessary for informed management, but evidence must be interpreted within institutional realities and guided by values that define the purposes of Islamic education.

Thus, the synthesis suggests that data-driven leadership in madrasahs should be understood as a context-sensitive and value-based model of strategic management. Its effectiveness depends on the capacity of leaders to connect evidence with institutional meaning, transform information into strategic priorities, mobilize organizational actors, and evaluate whether interventions genuinely improve educational quality. Such an approach moves data-driven leadership beyond the technical management of information toward a broader conception of educational governance in which data, leadership, organizational learning, contextual judgment, and Islamic ethics operate as interconnected components of continuous quality improvement.

CONCLUSION

This systematic literature review demonstrates that data-driven leadership in madrasahs is not merely the technical use of digital information systems but a strategic, contextual, and value-based process. Institutional data become meaningful when leaders possess adequate data literacy, critically interpret evidence, connect quantitative information with institutional realities, and transform findings into strategic decisions and appropriate organizational interventions. Educational quality therefore emerges through a continuous cycle in which data inform decisions, decisions generate interventions, interventions produce outcomes, and new evidence supports further improvement. The effectiveness of this process is strongly influenced by organizational culture, leadership capacity, collaboration, trust, and institutional context. In the madrasah context, Islamic values such as *amanah*, justice, *shūrā*, transparency, responsibility, and *maslahah* provide an ethical foundation for ensuring that data-informed decisions remain aligned with educational and moral objectives. The review contributes theoretically by positioning data-driven leadership at the intersection of evidence, strategic management, organizational learning, contextual judgment, and Islamic ethics. Practically, madrasahs should prioritize data literacy, collaborative inquiry, reflective evaluation, and leadership development alongside digital infrastructure. Future research should empirically test this framework across diverse madrasahs and institutional contexts.

REFERENCES

- Adawiyah, R., Zahrudin, Z., & Maftuhah, M. (2024). Manajemen Pendidikan Pesantren dalam Konteks Kebijakan Pendidikan Nasional: Analisis dan Rekomendasi. *Tarbiatuna: Journal of Islamic Education Studies*, 4(2), 764–771. <https://doi.org/10.47467/tarbiatuna.v4i2.7187>
- Affandi, M. A., Ali, N., & Barizi, A. (2024). Model of Students' Prophetic Character Building of Madrasah Aliyah in Responding to Global Sociocultural Change Era. *AL-ISHLAH: Jurnal Pendidikan*, 16(2), 991–1004. <https://doi.org/10.35445/alishlah.v16i2.4218>
- A'la, B. A., & Makhshun, T. (2022). Transformasi Pendidikan: Mentradisikan Digitalisasi Pendidikan Islam. *JOIES (Journal of Islamic Education Studies)*, 7(2), 159–170. <https://doi.org/10.15642/joies.2022.7.2.159-170>
- Almeida, F., & Morais, J. (2025). Non-Formal Education as a Response to Social Problems in Developing Countries. *E-Learning and Digital Media*, 22(2), 122–138. <https://doi.org/10.1177/20427530241231843>
- Alsbou, M. K. K., & Alsaraireh, R. A. I. (2024). Data-Driven Decision-Making in Education: Leveraging AI for School Improvement. *2024 International Conference on Knowledge Engineering and Communication Systems (ICKECS)*, 1, 1–6. <https://doi.org/10.1109/ICKECS61492.2024.10616616>

- Alsyabani, I. S., Shodiq, S. F., & Madjid, A. (2024). Strategic Leadership in Realizing Islamic Academic Culture in Muhammadiyah Universities: Systematic Literature Review. *AL-ISHLAH: Jurnal Pendidikan*, 16(4), 5640–5653. <https://doi.org/10.35445/alishlah.v16i4.5825>
- Amin, H., Sinulingga, G., Desy, D., Abas, E., & Sukarno, S. (2021). Issues and Management of Islamic Education in a Global Context. *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam*, 6(3), 608–620. <https://doi.org/10.31538/ndh.v6i3.1808>
- Annur, A. F., Sari, R., & Musa, M. M. (2022). Implementation of Environmental Education in Improving the Environmental Ethics of Madrasah Ibtidaiyah Students to Support SDGs 2030. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, 12(2), 579751. <https://doi.org/10.18592/aladzkapgmi.v12i2.7490>
- Ansori, A., Supangat, S., & Us, K. A. (2023). Mutu Pendidikan dalam Perspektif Islam. *Journal of Educational Administration and Leadership*, 4(2), 39–45. <https://doi.org/10.24036/jeal.v4i2.467>
- Arifin, I., Juharyanto, Mustiningsih, & Taufiq, A. (2018). Islamic Crash Course as a Leadership Strategy of School Principals in Strengthening School Organizational Culture. *SAGE Open*, 8(3), 2158244018799849. <https://doi.org/10.1177/2158244018799849>
- Arifin, Y., & Priyana, I. (2025). *Green Leadership*. Deepublish.
- Arruda Filho, N. de P., Hino, M. C., & Przybylowicz Beuter, B. S. (2019). Including SDGs in the Education of Globally Responsible Leaders. *International Journal of Sustainability in Higher Education*, 20(5), 856–870. <https://doi.org/10.1108/IJSHE-01-2019-0032>
- Bush, T., & Glover, D. (2014). School Leadership Models: What Do We Know? *School Leadership & Management*, 34(5), 553–571. <https://doi.org/10.1080/13632434.2014.928680>
- BZ, Z. B., Nuzulah, F., Muarifah, L., Zakiyah, Z. U., Ummah, W. R., Alfina, A. T., & Rozikin, D. A. (2024). Teacher Mentoring to Enhance Quran Reading Skills Using Card-Shot Hijaiyah Letter Media at Islamic Education of Qur'an. *Education and Sociedad Journal*, 2(1), 22–32. <https://doi.org/10.61987/edsojou.v2i1.558>
- Faqih, M. M., Najiburrohman, N., & Hasanah, M. (2025). Transformational Leadership in Developing the Quality of Lecturers' Careers in Islamic Higher Education. *Journal of Educational Management Research*, 4(1), 27–41. <https://doi.org/10.61987/jemr.v4i1.760>
- Fauziah, M. (2025). Prophetic Ethics and the Foundations of Islamic Leadership. *El-Sunan: Journal of Hadith and Religious Studies*, 3(1), 51–60.
- Franceško, M., & Nedeljković, J. (2022). The Role of Nonverbal Communication in Leadership Skills. In R. J. Sternberg & A. Kostić (Eds.), *Nonverbal Communication in Close Relationships: What Words Don't Tell Us* (pp. 51–74). Springer International Publishing. https://doi.org/10.1007/978-3-030-94492-6_3
- Göçen, A. (2021). Ethical Leadership in Educational Organizations: A Cross-Cultural Study. *Turkish Journal of Education*, 10(1), Article 1. <https://doi.org/10.19128/turje.811919>
- Goffar, A., & Miftahussurur, W. (2025). Preventing Early Marriage Through School–Community Partnerships in Islamic Education. *Dinamika: Jurnal Pengabdian Kepada Masyarakat*, 2(2), 1–13. <https://doi.org/10.70437/dinamika.v2i2.20>
- Greany, T., & Kamp, A. (2024). Working with Complexity: Leading School Networks in Aotearoa New Zealand and England. *Educational Management Administration & Leadership*, 52(5), 1047–1061. <https://doi.org/10.1177/17411432221124746>
- Harris, A., & Jones, M. (2021). Exploring the Leadership Knowledge Base: Evidence, Implications, and Challenges for Educational Leadership in Wales. *School Leadership & Management*, 41(1–2), 41–53. <https://doi.org/10.1080/13632434.2020.1789856>

- Hendro, J. (2024). Cross-Cultural Analysis: Leadership in Cross-Cultural Management. *SAJMR: Southeast Asian Journal of Management and Research*, 2(3), 34–50. <https://doi.org/10.61402/sajmr.v2i3.110>
- Kartika, I., Saepudin, S., & Setiawati, Y. H. (2022). Synergistic Transformational Leadership and Academic Culture on the Organizational Performance of Islamic Higher Education in LLDIKTI Region IV West Java. *Jurnal Dirosah Islamiyah*, 4(2), 283–297. <https://doi.org/10.47467/jdi.v4i2.1052>
- Ke, F., Xie, K., & Xie, Y. (2016). Game-Based Learning Engagement: A Theory- and Data-Driven Exploration. *British Journal of Educational Technology*, 47(6), 1183–1201. <https://doi.org/10.1111/bjet.12314>
- Mandinach, E. B., & Gummer, E. S. (2013). A Systemic View of Implementing Data Literacy in Educator Preparation. *Educational Researcher*, 42(1), 30–37. <https://doi.org/10.3102/0013189X12459803>
- Miftahussurur, W., & Firdaus, R. (2024). Analisis Konseptual Tentang Pendidikan Multikultural Dalam Perspektif Islam. *Al Yazidiy Jurnal Sosial Humaniora Dan Pendidikan*, 6(2), 130–144. <https://doi.org/10.55606/ay.v6i2.1288>
- Mundiri, A., Sain, Z. H., & Khomairohtusshiyamah, U. (2025). Reconstructing Transformational Leadership Through Islamic Values: A Model for Improving Institutional Performance in Islamic Education. *Mozaic: Islam Nusantara*, 11(2), 125–136. <https://doi.org/10.47776/mozaic.v11i2.1829>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., & Moher, D. (2021). The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- R, A. H. A., & Kamil, H. F. (2025). The Role of Transformational Leadership in Improving the Quality of Human Resources in Islamic Boarding Schools. *Journal of Islamic Education Research*, 6(2), 210–224. <https://doi.org/10.35719/jier.v6i2.480>
- Sartini, T., Nini, Suhaili, H., Novita, M., & Hikmah, R. (2025). Adaptive Learning Frameworks for Islamic-Based Character Education in Child-Friendly School Leadership. *Journal of Educational Management Research*, 4(2), 674–685. <https://doi.org/10.61987/jemr.v4i2.883>
- Schildkamp, K. (2019). Data-Based Decision-Making for School Improvement: Research Insights and Gaps. *Educational Research*, 61(3), 257–273. <https://doi.org/10.1080/00131881.2019.1625716>
- Snyder, H. (2019). Literature Review as a Research Methodology: An Overview and Guidelines. *Journal of Business Research*, 104, 333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Utama, I. C., & Akbar, R. F. (2023). Pesantren Education and Its Contribution to Developing Religious Values in Kudus Community. *Education and Sociedad Journal*, 1(1), 13–23. <https://doi.org/10.61987/edsojou.v1i1.405>