

Data-Driven vs Data-Informed Leadership: Implications for Quality Management in Public and Private Elementary Schools in Indonesia

Hasbiyallah^{*1}, Ujang Suyatman¹, Muhammad Haikal As-Shidqi¹, Eti Kurniawati¹

¹ Universitas Islam Negeri Sunan Gunung Djati Bandung, Indonesia

*Corresponding Author: hasbiyallah@uinsgd.ac.id

Submitted: 08-01-2026

Revised : 25-05-2026

Accepted: 10-10-2026

ABSTRACT. This study examines how principals in public and private elementary schools in Indonesia use assessment data to guide instructional leadership and improve teaching quality. Using a qualitative multisite case study, the research compares SDN 262 Panyileukan and SDIT Al-Azhar Syifa Budi, two Bandung schools operating under the same national assessment regime but under contrasting governance and resource conditions. Data came from semi-structured interviews with principals, curriculum leaders, and teachers; observations of academic supervision and school meetings; and analysis of ANBK/Rapor Pendidikan, planning, supervision, and instructional documents. The findings show a continuum of data use. In the public-school case, ANBK and Rapor Pendidikan primarily structured accountability, planning, and periodic supervision, although they also informed literacy and numeracy improvement. In the private Islamic-school case, principals combined national assessment results with academic, developmental, behavioral, and teacher-performance data and used them more continuously for supervision, coaching, and instructional adaptation. The study offers a context-sensitive account of instructional data sensemaking, showing that data's instructional value depends on principals' interpretive capacity, collaborative routines, and institutional conditions rather than on data availability alone. Because the study is limited to two urban schools, its claims are analytically transferable rather than statistically generalizable. Future research should test the proposed continuum across larger and more diverse school settings and examine how leadership support can strengthen data-informed practice under different resource constraints.

Keywords: *Data-Driven Leadership, Instructional Leadership, Islamic School Management, National Assessment, Elementary Education.*

 <https://doi.org/10.31538/munaddhomah.v7i4.2921>

How to Cite Hasbiyallah, Suyatman, U., As-Shidqi, M. H., & Kurniawati, E. (2026). Data-Driven vs Data-Informed Leadership: Implications for Quality Management in Public and Private Elementary Schools in Indonesia. *Munaddhomah: Jurnal Manajemen Pendidikan Islam*, 7(4), 905–921.

INTRODUCTION

Indonesia's implementation of the National Assessment (Asesmen Nasional Berbasis Komputer/ANBK) marks a shift from exam-oriented evaluation to a broader quality-monitoring system that emphasises literacy, numeracy, character, and the learning environment. Through Rapor Pendidikan, ANBK is expected to provide schools with actionable evidence for planning, supervision, and instructional improvement rather than merely producing achievement labels. (Aditomo et al., 2019; Rahmawati & Fadholi, 2024; Singh et al., 2025). This reform places evidence use at the centre of school improvement and creates new expectations for principals to translate assessment information into pedagogical action (Amzat et al., 2022; Arief et al., 2025; Daulay et al., 2024; Ningsih et al., 2025).

However, the growing availability of assessment data has not automatically improved the quality of teaching and learning at the school level. When data remain at the level of reporting, compliance, or general reflection, schools lose opportunities to diagnose learning needs, differentiate instruction, target teacher support, and monitor whether improvement efforts actually reach the classroom (Chotijah et al., 2025; Hariadi et al., 2025; Novrianti & Sari, 2025; Shobihah, 2025). This weak link between data and pedagogical action can hinder educational quality because the school's improvement cycle remains incomplete: evidence is produced, but it is not systematically translated into decisions that affect instructional practice (Farrell & Marsh, 2016; Rahmawati & Fadholi, 2024).

This limitation places school leadership at the centre of the problem. Recent studies show that effective data use depends not only on teachers' technical data literacy but also on principals' ability to frame problems, facilitate collaborative interpretation, connect evidence to supervision, and sustain follow-up through professional learning structures (Datnow & Hubbard, 2016; Lee et al., 2024; Mandinach & Gummer, 2016; Schildkamp et al., 2019). Without this leadership function, assessment systems risk producing administrative compliance rather than instructional improvement. Recent scholarship from 2019 to 2025 has strengthened understanding of data-informed leadership by examining principal data literacy, school data teams, teacher professional development, and collaborative data sensemaking (Datnow & Park, 2023; Jiang et al., 2025; Lee et al., 2024; Sandoval-ríos et al., 2025; Schildkamp et al., 2019; Spiele et al., 2025).

However, the evidentiary base remains uneven. Lee et al.'s (Lee et al., 2024) systematic review synthesises principal data-literacy studies largely at broad K–12 level, while school-context studies show that organisational conditions shape data-informed decision-making without isolating elementary public–private comparison as a central focus (Lee; O. et al., 2025; Park & Datnow, 2016). In the Indonesian literature, related elementary studies tend to examine single-school data-based planning or broader leadership-style differences rather than compare how public and private elementary principals use assessment evidence for instructional leadership (Ahyani et al., 2024; Brooks & Ezzani, 2022; Djumiastin et al., 2025; Hamdi et al., 2026; Yuliana et al., 2025). Accordingly, this article does not claim a total absence of prior work; instead, it addresses a more specific gap at the intersection of elementary instructional leadership, ANBK-related data use, and public–private comparison.

Responding to these gaps, this study aims to develop practical and conceptual insight into how data-driven leadership is enacted in public and private elementary schools in Indonesia. Specifically, it addresses three questions: (1) how are assessment data used for instructional decision-making in public and private elementary schools; (2) how do principals integrate assessment data into instructional planning, supervision, and teacher development; and (3) how do differences between public and private school contexts shape data-driven leadership practices? As a bounded multisite case study, the article does not seek statistical generalisation to all Indonesian schools. Rather, it uses two analytically contrasting cases in Bandung to generate transferable insight about how a common national accountability infrastructure is interpreted under different governance and resource conditions.

The selection of SDN 262 Panyileukan and SDIT Al-Azhar Syifa Budi was analytically purposeful. Both operate within the same urban policy environment and national assessment regime, reducing district-level policy variation. However, they differ in governance structure, funding flexibility, resource support, and educational orientation, making them well suited to examining how similar accountability demands may generate different leadership responses. The study contributes to the literature in two ways. Empirically, it offers a comparative account of how principals in one public and one private elementary school interpret and use ANBK-related evidence to improve instruction. Conceptually, it positions leadership practices along a continuum from compliance-leaning data use to data-informed instructional leadership grounded in instructional sensemaking. These contributions are intended as analytically transferable propositions rather than representative claims about all Indonesian public and private elementary schools.

METHOD

This study employed a qualitative multisite case-study design to examine how principals mediate between assessment evidence and instructional improvement. The unit of analysis was leadership practice, particularly how principals interpret and use ANBK/Rapor Pendidikan and other school data in instructional decision-making. The study purposively selected cases using a maximum-variation sampling strategy. SDN 262 Panyileukan is a public elementary school operating within a more formal bureaucratic structure and tighter resource constraints. In contrast, SDIT Al-Azhar Syifa Budi is a private Islamic elementary school with greater managerial flexibility and broader internal data resources. Both schools had experience using ANBK and Rapor Pendidikan and provided access to leadership routines, supervision activities, and institutional documents, enabling comparison under a shared national policy context.

We purposively selected participants for their direct role in the data-to-instruction decision chain: the principal as the strategic decision-maker, the vice principal/assistant principal for academic affairs as the coordinator of planning and supervision, and a teacher as the instructional implementer in each school (Table 1). We therefore treated the six informants as role-based key informants rather than a statistically representative sample. To strengthen evidentiary depth despite the small number of interviewees, we triangulated interview accounts with observations of academic supervision and school meetings and with documents including ANBK/Rapor Pendidikan outputs, RKAS/RKS, supervision notes, meeting minutes, and lesson-planning materials. This design allowed us to check reported practices against observed routines and documentary traces.

We analysed data iteratively by organising field materials, open coding, developing categories, conducting within-case thematic analysis, and comparing cases. Coding focused on the three research questions: forms and purposes of data use, mechanisms linking data to planning/supervision/teacher development, and institutional conditions shaping those mechanisms. Cross-case synthesis then identified recurring similarities, contrasts, and explanatory patterns. Credibility and dependability were strengthened through source and technique triangulation, member checking, and an audit trail, following qualitative case-study principles. (Creswell, 2009; Mtisi, 2022).

Table 1. Table of Interview Informants

Code	Position	School
SN1	Headmaster - Strategic decision-maker	Public Elementary School
CN1	Assistant Principal for Academic Affairs - Learning coordinator	Public Elementary School
TN1	Teacher - Instructional implementer	Public Elementary School
NT1	Headmaster - Strategic decision-maker	Islamic Elementary School
CT1	Assistant Principal for Academic Affairs - Learning coordinator	Islamic Elementary School
TT1	Teacher - Instructional implementer	Islamic Elementary School

Source: Data Collection, 2026

RESULT AND DISCUSSION

Result

How are Assessment Data Used for Instructional Decision-Making in Public and Private Elementary Schools

The observational findings indicate that principals at both research sites use assessment data to inform instructional decision-making through diagnostic and iterative mechanisms; however, they differ in the level of formalisation and the breadth of data sources used. Based on observations, SDN 262 Panyileukan uses Rapor Pendidikan results, particularly literacy and numeracy data from the National Assessment and Computer-Based Assessment, as its primary assessment reference. At the beginning of the semester, teachers discuss the national assessment results in a forum to identify classes that need instructional reinforcement. Furthermore, teachers

integrate ANBK indicators into teaching plans, such as lesson plans and academic supervision programs, so the data directly determines the focus of teacher competency development.

In contrast to the public school context, observations at SDIT Al-Azhar Syifa Budi revealed a more continuous and integrated use of assessment data. Beyond ANBK data, the school routinely used internal sources, including psychological and IQ test results, records of students' physical development, and teacher performance data from classroom supervision. The curriculum team discussed these data in curriculum team meetings and instructional reflection forums to support instructional decision-making focused on holistic learning development, including strengthening literacy, numeracy, and science, as well as enrichment programs such as robotics.

I review the ANBK results from the Rapor Pendidikan and then determine instructional improvement priorities. These findings provide a concrete basis for our actions. Based on the visible student competency map, we developed targeted intervention programs, launched a regular morning literacy program, and revised the Learning Implementation Plan to emphasise identified areas of weakness. (SN1).

In private Islamic schools, the principal emphasised that instructional decision-making is not based on a single data source. Instead, the process comprehensively integrates various forms of student data, including academic assessment results, behavioural observations, and non-cognitive development, to build a holistic understanding. Informant statements further corroborated these observational findings. The principal of SD Negeri 262 Panyileukan explained that ANBK results form the basis for determining instructional priorities and academic supervision.

In strategic planning, we use literacy and numeracy data from the Rapor Pendidikan as the main reference. These two data points serve as critical benchmarks and starting points for objective analysis. Next, we integrate them with other data sources to obtain a comprehensive diagnosis of learning quality in our schools. (NT1)

We receive classroom supervision quite frequently. After each supervision, we always communicate and discuss the results collectively, then use them as a basis for reflection to improve our teaching in subsequent lessons. (Interview TT1)

In response to these initial findings, the cross-case analysis shows that both schools treat assessment data as an important basis for instructional decision-making, but with different levels of breadth and continuity. In the public school, ANBK and Rapor Pendidikan serve as the primary reference for identifying priority problems in literacy and numeracy and for guiding formal improvement programs. In the private Islamic school, ANBK data are combined with internal academic, psychological, behavioural, and teacher-performance data, producing a more comprehensive diagnosis of student and instructional needs.

These findings indicate that the same assessment system can generate different decision-making routines depending on school context. Data use in public schools is more episodic and accountability-oriented, whereas in private schools it is more continuous and integrated into ongoing reflection. This distinction matters because the depth of data use influences how far evidence moves beyond diagnosis to shape actual instructional quality. Table 2 summarises differences in assessment data utilisation patterns for instructional decision-making between public schools and integrated Islamic private schools, showing variations in data focus, purposes of use, decision-making instruments, and the frequency of data utilisation.

Table 2. Utilisation of Assessment Data in Instructional Decision-Making

Aspect	SDN 262 Panyileukan	SDIT Al-Azhar Syifa Budi
Data focus	Primarily ANBK data	ANBK plus psychological, IQ, physical development, and teacher performance data
Purpose	Improvement of foundational quality (literacy and numeracy)	Holistic education
Decision-making instruments	Lesson plans (RPP), academic supervision, and morning literacy programs	Teacher reward systems, character development programs, and cross-unit integration
Frequency of data use	Annual and quarterly	Weekly and continuous

Source: Data Collection, 2026

How do Principals Integrate Assessment Data Into Instructional Planning, Supervision, and Teacher Development

The observational findings indicate that SD Negeri 262 Panyileukan implements data-driven leadership strategies systematically, particularly by integrating National Assessment results into instructional planning and school quality-improvement programs. The school explicitly incorporates ANBK indicators, especially literacy and numeracy, into planning documents such as the School Activity and Budget Plan (RKAS), school work programs, and academic supervision plans. Assessment data also inform teacher-development planning, making support more focused, relevant, and directly connected to classroom improvement. Observations of teacher development activities show a close relationship between lesson planning and assessment results. The school also organises professional development and coaching through National Assessment data-analysis workshops and regular reflection forums.

SD Negeri 262 Panyileukan monitors the implementation of data-driven learning directly through classroom supervision. The principal and vice principal for curriculum regularly conduct classroom observations to verify that data-driven learning plans are implemented effectively. They then used the results of these supervision activities to provide feedback and refine instruction in subsequent instructional cycles. In contrast, observations at SDIT Al-Azhar Syifa Budi revealed a more holistic and intensive leadership strategy. The school conducted daily and weekly learning supervision through both scheduled and situational approaches to ensure teaching aligned with student-development data.

Observations also revealed a tiered teacher reward system, with assessments based on teaching performance, literacy depth, language proficiency, and professional track record. This system was integral to the school's leadership strategy to encourage consistent data use and improve instructional quality. The school also routinely organised training programs and workshops grounded in holistic data use, integrating students' academic, psychological, spiritual, and physical dimensions into instructional planning. The observational findings at SD Negeri 262 Panyileukan were further reinforced by the principal's statement, which emphasised that the results of the National Assessment are directly employed in the school's strategic planning processes:

We incorporate the results of the National Assessment into the School Activity and Budget Plan (RKAS), the school work programs, academic supervision, and teacher competency development initiatives. These data guide planning priorities and follow-up actions within the school. (SN1)

We support teachers through coaching clinics and regular training sessions. The focus is on helping teachers understand assessment results and integrate them into instructional planning. (CN1)

We always use supervision results as evaluation feedback. Based on these findings, we improve our teaching practices and adjust instruction to meet students' needs, enabling continuous performance improvement. (TT1)

During the activity, the principal directly observed instruction, including teacher-student interaction, student participation, instructional strategies, and the organisation of the learning environment. The observation enabled the principal to gather contextual evidence on the strengths and challenges of the instructional process, rather than relying solely on assessment records or teachers' reports. The evidence further indicates that supervision functioned not only as an administrative monitoring mechanism but also as a practical approach to improving instructional quality and strengthening teachers' professional development. The principal further emphasised that all data collected are used as a foundation for instructional decision-making:



Figure 1. Observation of Instructional Supervision

In response to this second finding, both principals mediated between assessment results and instructional follow-up, but their leadership strategies differed in intensity and design. SDN 262 Panyileukan integrated ANBK indicators into planning documents, lesson plans, and periodic academic supervision, reflecting a structured but largely formal follow-up model. SDIT Al-Azhar Syifa Budi adopted a broader strategy, using multiple data sources to inform daily or weekly supervision, teacher coaching, and performance-related professional support. These differences highlight the role of principal capacity in data use.

When leadership capacity focuses on compliance and formal planning, data tend to inform documents and scheduled supervision. Where principals have stronger capacity to interpret multiple forms of evidence and organise sustained coaching, data become part of an ongoing cycle of instructional improvement and teacher learning. Table 3 summarises the differences between the two schools in data-driven leadership strategies for integrating assessment results into learning planning. The table highlights variations in supervision approaches, teacher training, reward systems, and the focus of learning development.

Table 3. Differences in Leadership Strategies for Integrating Assessment Results

Strategy	SDN 262 Panyileukan	SDIT Al-Azhar Syifa Budi
Integration into lesson planning (RPP)	Based on National Assessment (AN) indicators	Based on holistic student data
Supervision practices	Periodic academic and classroom supervision	Daily, unannounced, and scheduled supervision
Teacher professional development	National Assessment data analysis	Literacy, numeracy, and character-building programs
Reward system	Not implemented	Tiered teacher rewards based on competency levels
Instructional focus	Instructional improvement aligned with policy standards	Holistic education (heart, intellect, and physical development)

Source: Data Collection, 2026

How do Public and Private School Contexts Shape Data-Driven Leadership Practices

Field observations revealed two qualitatively different data-driven leadership landscapes between the schools, extending beyond technical patterns to the depth of data interpretation and the philosophical orientations guiding their learning practices. At SD Negeri 262 Panyileukan, National Assessment (ANBK) data serves as the primary reference for instructional planning, evaluation, and intervention, with Rapor Pendidikan analysis directly informing literacy and

numeracy priorities, lesson plan (RPP) revisions, and academic supervision. This data integration, explicitly reflected in the School Work Plan and Budget (RKAS), strongly aligns with public accountability and compliance with national standards. In contrast, SDIT Al-Azhar Syifa Budi treats ANBK as just one component of a much broader, holistic data ecosystem. Their instructional decision-making, classroom supervision, and teacher development rely on a comprehensive set of internal metrics, including psychological and IQ test results, physical development records, language proficiency, and character data, ensuring that learning practices are informed by multiple diverse sources rather than a single assessment.

Differences in practice were also evident in supervision systems and teacher performance management. At SD Negeri 262 Panyileukan, academic supervision is conducted on a scheduled, periodic basis, primarily focusing on aligning lesson plans and teaching practices with ANBK-based recommendations. Conversely, at SDIT Al-Azhar Syifa Budi, learning supervision is more intensive, conducted daily, weekly, and in response to the situation, to ensure teacher practices are grounded in student development data and the school's holistic learning standards. Furthermore, observations indicate that SDIT Al-Azhar Syifa Budi has implemented a tiered professional reward system as part of its data-driven leadership strategy. This system functions as a motivational instrument to encourage teachers to continuously improve instructional quality based on performance data and student development indicators. The study did not observe such practices at SD Negeri 262 Panyileukan.

We use the National Assessment results as our primary foundation. We then integrate this data into school planning, from developing the School Work Plan (RKAS) and work programs to academic supervision and teacher competency improvement programs. (SN1).

We do not rely solely on National Assessment data. Since the student admissions process, we have built a comprehensive database, from psychological assessments and IQ tests to physical development records and literacy and numeracy achievements. This data underpins every learning decision we make. (NT1).

The principal of SDIT Al-Azhar Syifa Budi further emphasised differences in supervision approaches, explaining that school supervision is designed to remain flexible and responsive to the dynamics of classroom practice. From a more critical perspective, the principal of SDIT Al-Azhar Syifa Budi emphasised that a strong, multidimensional collaborative ecosystem, both horizontally among teachers and vertically across school levels, constitutes a form of social capital that enables the translation of policy into practice.

Meanwhile, the principal of SD Negeri 262 Panyileukan openly acknowledged two structural challenges that limit deeper use of assessment data: teachers' limited capacity to interpret ANBK results and budget constraints that narrow the space for data-based learning innovation. The contrast in data-driven leadership practices between these two schools can be mapped comparatively (see Table 4). The table outlines key differences across five dimensions: data focus, supervision ecosystem, resource support, educational orientation, and learning planning architecture.

Table 4. Differences in Data-Based Leadership Practices for Instructional Quality

Dimension	SDN 262 Panyileukan	SDIT Al-Azhar Syifa Budi
Data focus	National Assessment (ANBK)	Holistic, multi-source data
Supervision practices	Formal and periodic	Daily, unannounced, and intensive
Human resource capacity	Limited	Strong and well-supported
Educational orientation	Compliance with national standards	Holistic education
Organisational work culture	Collaborative	Strong cross-level collaboration
Financial support	Limited	Substantial and sustainable
Planning approach	ANBK-based planning	ANBK-based planning

Source: Data Collection, 2026

In response to RQ3, the most visible differences concern leadership orientation, supervision intensity, available resources, and the architecture of organisational learning. The public school reflects a pattern of data-driven compliance in which leaders rely primarily on ANBK to meet accountability demands and align school programs with policy expectations. The private Islamic school reflects a data-informed pattern in which leaders mobilise multiple data sources, stronger resource support, and a collaborative culture to guide more adaptive instructional decisions. Taken together, these results suggest that public-private differences do not merely affect the quantity of data available; they also shape the meaning leaders assign to data and the actions that follow. Governance flexibility, financial support, teacher collaboration, and principal capacity all influence whether data remain administrative signals or become pedagogical tools for improving classroom practice.

Across RQ1-RQ3, the findings point to a broader conclusion: data-driven leadership at the elementary school level does not operate in a single standardised form. Rather, it is enacted through context-sensitive patterns that combine available data, leadership capacity, supervision design, and organisational culture in different ways. These differences extend beyond the types of data used to include decision-making orientation, the principal's role as an instructional supervisor, and the depth of data integration into planning and classroom practice. To synthesise the empirical findings across the three research questions and clarify the study's conceptual contribution, the results are consolidated into a typology of data-driven instructional leadership. This typology captures the principal differences in leadership orientation, data-utilisation practices, supervision strategies, and institutional conditions identified across the two research sites.

Table 5. Typology of Data-Based Instructional Leadership in Indonesian Elementary Schools

Dimensions	Data-Driven Compliance	Data-Informed Instructional Leadership
Leadership orientation	Policy compliance and accountability	Instructional improvement and learning development
Primary data sources	National Assessment (ANBK) as a single dominant source	Multi-source data (ANBK, formative assessments, student development data, teacher performance data)
Meaning of data	Data as performance indicators to be fulfilled	Data as evidence for professionals interpretation and pedagogical sensemaking
Role of the principal	Administrative manager and policy implementer	Instructional leader, supervisor, and learning facilitator
Supervision practices	Formal, periodic, and	Ongoing, reflective, and formative
Teacher involvement	Document-oriented supervision	Supervision integrated with coaching
	Limited participation in data interpretation	Collaborative data dialogue within Professional learning communities
Instructional planning	Alignment with standardised indicators and targets	Alignment with standardised indicators and targets
Institutional context	Predominantly public elementary schools	Predominantly Islamic private Elementary schools
Instructional impact	Changes in programs and documents	Changes in classroom practices and Teacher professional growth

Source: Data Collection, 2026

The typology and spectrum presented above provide a conceptual lens for interpreting how instructional leadership is enacted through data use across different institutional contexts. Rather than viewing data use as uniform, this study's findings show that leadership practices move along a continuum from compliance-oriented data use to instructional data sensemaking oriented toward instructional improvement. The discussion section examines these findings by situating them within the theoretical frameworks of instructional leadership and Data-Driven Decision-Making.

Discussion

Rethinking Instructional Leadership as Instructional Data Sensemaking

The findings suggest that data-driven instructional leadership in elementary schools is better understood as a continuum than as a fixed model. At one end is data-driven compliance, in which ANBK and Rapor Pendidikan data primarily satisfy accountability and formal planning requirements (Fullan, 2007; Hasbiyallah et al., 2026). At the other end is data-informed instructional leadership, in which leaders treat data as a starting point for diagnosis, professional dialogue, supervision, and pedagogical adaptation. This continuum extends existing accounts of instructional leadership by placing data sensemaking at the core of how principals define improvement priorities and support teaching quality (Bahrudin et al., 2026; Datnow & Park, 2023; Haqqi et al., 2025; John & Catherine, 2011; Lee et al., 2024).

The public-school case complicates the assumption that compliance-oriented data use is necessarily non-instructional. Its formal alignment of ANBK results with the RKAS, lesson planning, and academic supervision created a workable structure for improving literacy and numeracy. Previous research similarly suggests that organisational systems, leadership arrangements, and implementation conditions, rather than data availability alone, shape data-driven decision-making (Ming et al., 2024; Rahabav, 2016). In this case, therefore, the main limitation was not the absence of instructional action, but the tendency for such action to remain concentrated in formal programmes and periodic supervision, reducing opportunities for sustained pedagogical inquiry and continuous professional reflection (Ming et al., 2024; Piatanom, 2025).

The private-school case demonstrated a stronger data-informed tendency, although broader data use should not automatically be interpreted as a superior leadership model. Sensemaking is an organisational process in which actors collectively construct meaning from complex, sometimes ambiguous information rather than simply responding mechanically to available evidence (Brown et al., 2015; Davies et al., 2004). The present case illustrates that sensemaking requires supportive organisational routines, including stronger resource provision, collaborative norms, frequent supervision, and internal performance mechanisms that enable actors to interpret multi-source evidence and translate it into instructional action. The distinction between being data-driven and data-informed similarly rests on the extent to which professional judgement mediates the interpretation and use of evidence (Chairawati et al., 2026; Haase et al., 2024; Hakim et al., 2026; Indasari, 2026). The instructional value of the private school's broader data ecosystem therefore depended not on the volume of available data alone, but on the organisational capacity to interpret, discuss, and convert those data into pedagogically meaningful decisions.

Principal capacity emerged as a mediating mechanism between data availability and instructional improvement in both cases (Hasbiyallah et al., 2024). Data literacy has increasingly been identified as a central leadership capability because principals are expected to understand evidence, identify relevant patterns, and connect data to instructional priorities (Lee et al., 2024). At the same time, evidence-informed decision-making depends on organisational conditions that enable leaders and teachers to interpret data collectively and use it within school improvement processes (Datnow & Park, 2023). The present findings connect these perspectives by showing that principals must not only interpret indicators but also facilitate professional dialogue and translate collective conclusions into supervision, coaching, instructional planning, and teacher development.

The two cases also show that instructional data sensemaking is fundamentally a collective, not exclusively individual, process. Collaborative conversations within data teams can shape how educators interpret evidence, construct shared understandings of instructional problems, and formulate appropriate responses (Wijnia et al., 2016). However, the present findings indicate that such professional dialogue does not emerge automatically simply because assessment data are available. Its development depends on sufficient time, relational trust, leadership facilitation, and repeated organisational routines that allow teachers and school leaders to revisit evidence and evaluate instructional responses collectively (Jena et al., 2017). In the public-school case, data

dialogue remained relatively episodic. It was closely connected to formal planning and supervision cycles, whereas in the private-school case it was more strongly institutionalised through recurring supervision and collaborative routines. The movement from compliance-oriented data use toward data-informed instructional leadership therefore requires not only stronger individual data-literacy skills but also an organisational infrastructure that sustains professional sensemaking over time.

Institutional Context and Variations in Data-Based Leadership Practices

The contrast between the two schools indicates that institutional context strongly mediates how assessment data are interpreted and used. In the public-school case, bureaucratic routines, resource constraints, and formal accountability requirements tended to encourage narrower and more episodic forms of data use (Blanc et al., 2010). In the private-school case, greater governance flexibility, stronger resource support, and a collaborative organisational culture created more room for holistic interpretation and sustained instructional follow-up. Previous research similarly suggests that school context influences the effectiveness of leaders' data-informed decision-making and shapes the organisational conditions under which evidence is translated into action (Lee; O. et al., 2025; Park & Datnow, 2016). The present study extends this argument by showing that the same national assessment regime can generate different instructional routines when schools operate under contrasting institutional conditions.

The private Islamic elementary school demonstrated greater flexibility in combining national assessment results with internally generated evidence. Data served not only as performance indicators but also as resources for pedagogical reflection, ongoing supervision, instructional planning, and teacher professional development (Larche, 2025). This institutional flexibility enabled the principal to integrate ANBK results with information on academic development, student character, teacher performance, and other school-based indicators, producing a more contextual and responsive pattern of instructional decision-making. Such practices show how organisational capacity can broaden the range of evidence leaders can mobilise for instructional improvement (Datnow & Park, 2023; Lee; O. et al., 2025).

However, the differences between the two schools are better interpreted as differences in dominant orientation rather than as two entirely separate leadership models. The public-school case still demonstrated elements of reflection, instructional follow-up, and pedagogical adjustment, while the private-school case continued to operate within formal accountability structures and performance expectations. The principal distinction, therefore, concerns the balance between treating data as a compliance signal and treating it as a resource for professional interpretation. Viewing the cases as positions along an overlapping continuum avoids an overly binary classification and better reflects how accountability and instructional purposes coexist in both settings (Park & Datnow, 2016).

The findings also qualify the assumption that richer evidence-use systems automatically produce deeper organisational learning. More data volume or diversity does not necessarily lead to more meaningful professional learning unless schools have organisational routines that support interpretation, dialogue, and follow-up (Haase et al., 2024). In the private-school case, a richer data ecosystem supported more adaptive instructional leadership; however, it simultaneously required stronger coordination and introduced the possibility of increased evaluative pressure through internal performance-management mechanisms. This suggests that expanded data systems can support learning while also intensifying monitoring and accountability, depending on how they are organised and interpreted. Conversely, the public-school case demonstrates that institutional constraints can narrow the scope and frequency of data use without necessarily indicating weak leadership commitment to instructional improvement. Compliance structures may provide useful coordination and accountability mechanisms, but they can also limit leaders' discretion when evidence use becomes closely tied to prescribed indicators, reporting routines, and resource constraints (Besharati & Izadi, 2022). The issue, therefore, is not simply whether a school adopts a data-driven or data-informed model, but how institutional arrangements expand or constrain

leaders' opportunities to exercise professional and pedagogical judgement in interpreting evidence (Silva, 2025).

The findings further suggest that when data function predominantly as instruments of control and reporting, the meaning of educational improvement can narrow to measurable indicators, reducing opportunities for broader professional interpretation (OECD, 2013). However, this study adds an important contextual qualification: such narrowing is driven by accountability structures, resource availability, and institutional environments, rather than solely individual leadership limitations. By contrast, when data support organisational learning and collective reflection, instructional leadership becomes more adaptive and responsive to students' holistic needs. Because sensemaking involves interpreting complex organisational realities rather than simply reacting to formal indicators, professional dialogue becomes central to translating evidence into action (Brown et al., 2015) a perspective especially relevant in elementary education, where instructional decisions are deeply connected to the relational, developmental, and socio-emotional dimensions of learning.

The collective dimension of sensemaking further suggests that organisational actors, rather than leaders or teachers individually, produce the meaning of data through interaction. Shared interpretation allows educators to negotiate competing meanings, connect evidence to local experience, and develop more context-sensitive responses to instructional problems. (Maitlis, 2014). When principals and teachers use assessment information as a basis for collaborative reflection rather than merely as performance benchmarks, they are better positioned to design flexible, contextualised pedagogical responses that respond to students' needs. Collaborative data use can therefore support more meaningful instructional decision-making when embedded in sustained professional routines and supportive organisational conditions (Park & Datnow, 2016).

Taken together, these findings suggest that institutional context should not be treated merely as a background variable in data-driven leadership, as governance arrangements, resource structures, accountability demands, and professional cultures actively shape which evidence is considered legitimate, how often it is discussed, and what instructional responses become possible. The practical challenge for Indonesian elementary schools is therefore not simply to increase access to data, but to build organisational conditions that enable leaders and teachers to interpret evidence collaboratively and convert it into sustained pedagogical improvement (Anderson et al., 2010). Ultimately, the effectiveness of data-driven instructional leadership depends not only on data availability, but also on how this institutional context shapes the logic of meaning and patterns of data use in everyday leadership practices.

Table 6. Theoretical Analysis and Research Contributions

Key Aspects	Key Findings	Conceptual Contribution
Data Orientation	Data-driven leadership practices move from data-driven compliance to data-informed instructional leadership.	Affirm instructional leadership as a spectrum of practice.
The Role of the Principal	The principal mediates assessment data to supervision, learning, and teacher development	Rethinking instructional leadership as instructional data sensemaking.
Supervision Practices	Formative and reflective supervision is more impactful than formal-administrative supervision supervision	Shift supervision from control to professional learning
Institutional Context	Bureaucratic structure encourages compliance, and flexibility encourages holistic data use	Demonstrate the institutional context as a mediator of data use effectiveness.

Culture & Teachers	Collaborative culture encourages teacher involvement in the interpretation of data.	Positioning instructional leadership as a collective social practice.
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Source: Data Collection, 2026

Implications for Instructional Leadership and Data Use in Elementary Schools

The first practical implication of this study is that support for principals should be differentiated by school context rather than framed as a generic call for better leadership. Principals' ability to use data effectively depends not only on individual data-literacy competencies but also on the organisational conditions that enable those competencies to be translated into instructional action (Lee; O. et al., 2025; Park & Datnow, 2016). In schools resembling SDN 262 Panyileukan, where budgets and staffing are tighter, the immediate need is not necessarily a complex new data system but protected routines that connect ANBK findings to a small number of instructional priorities. Research on effective school data use similarly indicates that focused goals, leadership facilitation, and manageable organisational routines matter more than simply increasing available data (Lee et al., 2024; Schildkamp et al., 2019). Practical steps include using existing teacher meetings to review one or two priority indicators, aligning supervision instruments with those indicators, and documenting short-cycle follow-up actions that are feasible within existing workloads.

At the school level, structured professional dialogue should likewise be tailored to observed school conditions. Collaborative data conversations are more productive when educators focus on clearly defined instructional problems and jointly interpret evidence in relation to classroom practice (Jiang et al., 2025). In the public-school case, dialogue is therefore more useful when embedded in already scheduled forums and focused on manageable problems such as literacy reinforcement, numeracy misconceptions, or lesson-plan revision. Effective data teams also depend on leadership practices that provide clear goals, professional support, and sufficient opportunities for collaborative inquiry (Udomkijmongkol et al., 2025). In the private-school case, where collaboration is already stronger, the more urgent task is to formalise how schools prioritise multiple data sources so teachers are not overwhelmed by data abundance and supervision and reward systems remain developmental rather than merely performative. Richer data environments do not automatically improve professional judgement unless schools establish clear processes for interpreting and prioritising evidence.

A second implication concerns teacher data literacy. The findings suggest that teacher learning is most useful when it is directly tied to the supervision cycle observed in schools rather than delivered as detached workshop content. Data literacy involves transforming assessment information into actionable instructional knowledge rather than merely understanding indicators or interpreting scores (Mandinach & Gummer, 2016). Teachers' beliefs, confidence, and professional capacity also shape whether they incorporate available evidence into instructional practice. (Datnow & Hubbard, 2016). For public elementary schools, this means providing simple coaching around interpreting ANBK or Rapor Pendidikan indicators and converting them into lesson adjustments. For better-resourced private schools, it means strengthening teachers' capacity to integrate academic, behavioural, and developmental evidence without diluting attention from core instructional problems. Professional development is more likely to influence teaching when it is sustained, practice-oriented, and directly connected to teachers' instructional decision-making. (Sandoval-ríos et al., 2025; Spiele et al., 2025).

At the policy level, the study suggests that strengthening ANBK's impact requires more than improving dashboards or reporting instruments. Assessment systems are more likely to support school improvement when accountability requirements are paired with mechanisms that strengthen professional learning and organisational capacity (OECD, 2024). Data use is also embedded within a broader ecology of people, practices, policies, and organisational patterns, meaning that the same policy requirement may generate different outcomes across schools (Park & Datnow, 2016). Public schools therefore need differentiated support, including facilitation time, supervision coaching, and

low-burden planning templates that help principals move from annual reporting to instructional follow-up. Private schools, meanwhile, may benefit from guidance on the ethical use of multi-source data, moderation of internal performance systems, and safeguards against data overload. A uniform policy demand for data use is unlikely to produce equivalent improvement across institutional settings characterised by different levels of governance flexibility, professional capacity, and resource availability (Am et al., 2026; Musa et al., 2024; Nurlaili, 2023).

These implications are relevant beyond the two cases studied here only in an analytical sense. Because the study is based on two urban schools in Bandung, transferability depends on whether other schools face comparable combinations of governance arrangements, accountability pressures, resource flexibility, and collaborative culture. Qualitative case-study findings aim to support analytical understanding through contextual depth rather than statistical generalisation, so transparent case boundaries are essential for judging their relevance to other settings (Creswell, 2009; Mtisi, 2022). The value of the findings therefore lies in offering context-sensitive design principles rather than prescribing a single national model of data-driven leadership.

Overall, the study suggests that improving data use in elementary education requires a human and organisational infrastructure around the data itself: capable principals, data-literate teachers, collaborative routines, formative supervision, and policy support that rewards meaningful instructional follow-up. Leadership effects on teaching and learning often flow through organisational conditions that strengthen professional capacity and collaborative learning, rather than through leaders' actions alone (Hallinger & Heck, 2010). Similarly, sustained data-literacy development and collaborative evidence use are more likely to improve instruction when embedded in ongoing professional routines. Assessment information therefore becomes a meaningful pedagogical resource only when schools possess the professional and organisational capacity to interpret evidence, coordinate instructional responses, and evaluate follow-up over time

CONCLUSION

This study shows that assessment evidence gains instructional value through leadership practices that link interpretation to action. For RQ1, both schools used ANBK/Rapor Pendidikan to identify instructional priorities. However, the public-school case relied more heavily on national indicators, whereas the private Islamic-school case combined them with a wider range of internal evidence. For RQ2, both principals linked data to planning, supervision, and teacher development. However, the public case used a more structured, periodic cycle, while the private case embedded evidence in more continuous supervision, coaching, and performance support. For RQ3, these differences were associated with governance flexibility, resource support, collaborative culture, and principal capacity. The cases therefore occupy different positions on a continuum from data-driven compliance to data-informed instructional leadership rather than representing two mutually exclusive models.

Conceptually, the study contributes the notion of instructional data sensemaking: the proposition that data improve teaching not by their availability alone but through principals' capacity to interpret evidence collaboratively, integrate it with supervision and professional learning, and mobilise institutional conditions for pedagogical follow-up. The study is limited by its two-case, urban design and by a small set of role-based interview informants. However, the study triangulated interviews with observations and documents; the findings are analytically, rather than statistically, generalisable. Future studies should examine the continuum across larger, rural-urban, and cross-regional samples, include a wider range of teachers and system actors, and investigate longitudinally whether strengthened data literacy, collaborative routines, and supervision support produce sustained changes in classroom practice.

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