

Original Research Article

From Numbers to Nurture: Data-Based Accreditation and Learning Quality in a Frontier Elementary School, East Kalimantan, Indonesia

Bernadetha Baweq^{1*}, Sukardi¹, Dodot Sapto Adi¹

¹Universitas Merdeka Malang, Indonesia

Article History

Received: 06.07.2026

Accepted: 31.08.2026

Published: 03.09.2026

Journal homepage:

<https://www.easpublisher.com>

Quick Response Code



Abstract: Data-based accreditation requires schools not only to fulfill administrative documentation but also to use data as a foundation for improving learning quality. This study examines the effect of data-based accreditation on learning quality and identifies inhibiting factors at State Elementary School 007 Mamahak Besar, under the Education and Culture Office of Mahakam Ulu Regency, a frontier, outermost, and least-developed (3T) region of East Kalimantan. Employing an associative quantitative approach with a survey method, data were collected from 16 respondents, the principal and teachers, through questionnaires, observation, documentation, and supporting interviews, using a two-variable instrument of 24 items each, analyzed through Likert-scale scoring, percentage analysis, and simple linear regression. Findings show data-based accreditation fell in the very good category (86.72 percent), as did learning quality (89.64 percent). Regression yielded $Y = 22.847 + 0.814X$, with $r = 0.760$ and $R^2 = 57.74$ percent, confirmed significant ($t = 4.374 > t\text{-table} = 2.145$). Data-based accreditation contributed to learning-quality improvement through school-data availability, education-report utilization, document completeness, evaluation follow-up, and resource support, while inhibiting factors included limited teacher data literacy, constrained digital facilities and connectivity, administrative workload, and the need for sustained technical mentoring.

Keywords: Data-Based Accreditation, Learning Quality, Elementary School, Education Policy, Frontier Region, Mahakam Ulu.

Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

1. INTRODUCTION

This introduction proceeds by situating data-based accreditation within Indonesia's broader education-quality-assurance reform, before narrowing to the specific institutional and geographic context of Mahakam Ulu Regency and the particular research gap this study addresses.

Education constitutes one of the principal pillars of national development, functioning to shape human resources that are qualified, competitive, and adaptive to change. Within a development framework, education is understood not merely as a process of knowledge transfer but as a means of character formation, skill development, and national-value cultivation. A nation possessing a strong education system more readily achieves progress across economic, social, and technological sectors.

In Indonesia, education constitutes a priority within the national development agenda, consistent with the constitutional objective of educating the life of the

nation. Education-quality improvement functions as a critical indicator of long-term development success, with quality education generating a generation capable of driving innovation, improving productivity, and strengthening national competitiveness globally. Basic and lower-secondary education form the primary foundation for shaping student character and academic capability, with Law No. 20 of 2003 on the National Education System mandating education delivery that is high-quality and relevant to contemporary need. Efforts to improve education quality in Indonesia, however, frequently confront the challenge of school-quality diversity and inter-regional learning-outcome disparity, necessitating a robust external evaluation system oriented toward continuous improvement to ensure every school achieves national quality standards.

Information and communication technology advancement has brought substantial change to education, including quality-management and -assurance systems, demanding that education become more adaptive, transparent, and data-driven in decision-

making. One form of this transformation is data-based education-system implementation, including within school accreditation and quality-evaluation processes. Data sources including the Basic Education Data system (Dapodik), National Assessment results, and education quality reports (Rapor Pendidikan) increasingly form the basis for assessing education-unit performance more objectively. In the digital era, education quality is measured not only by final learning outcomes but also by technology-based learning process, learning innovation, and teacher capacity to utilize data for instructional improvement, demanding that schools strengthen digital literacy, data-analysis capability, and technology utilization to meet twenty-first-century education challenges.

Notwithstanding these education-quality-improvement efforts, learning-quality disparity persists across schools, particularly in frontier, outermost, and least-developed (3T) regions such as Mahakam Ulu Regency, indicating that equitable education quality has not been fully achieved across input, process, and output dimensions. This condition manifests across several dimensions, including uneven teacher-quality distribution, with some educators not yet possessing optimal pedagogical and professional competence; learning processes in many education units that remain insufficiently effective, innovative, or student-centered, generating suboptimal learning outcomes; and educational facility and infrastructure limitation, including learning facilities, technology access, and instructional media, further compounding regional education-quality conditions. This situation underscores the need for a more objective, measurable, data-based education quality-assurance system, enabling school evaluation and improvement to proceed more accurately and sustainably consistent with genuine field conditions.

School accreditation is governed under Regulation of the Minister of Education, Culture, Research, and Technology No. 38 of 2023 on Accreditation of Early Childhood, Basic, and Secondary Education, and Decree of the Minister of Education, Culture, Research, and Technology No. 246/O/2024 on Accreditation Instruments for Early Childhood, Basic, and Secondary Education. This regulatory framework mandates that education units be assessed across four core components: educator performance in managing student-centered learning process, principal leadership in education-unit management, learning-environment climate, and graduate or student learning-outcome competency. Data-based accreditation specifically emphasizes utilizing internal and external evaluation results, including education quality reports, student assessment outcomes, and teacher performance data, as empirical evidence and reflective foundation for schools, encouraging schools toward self-assessment and quality-improvement programming grounded in measurable actual data rather than assumption alone, with the objective of ensuring accreditation recommendations

translate into concrete action directly impacting education-quality improvement, particularly learning quality.

Theoretically, data-based accreditation implementation should trigger a continuous school-improvement cycle culminating in learning-quality enhancement, reflected in innovative teacher instructional practice, high student engagement, and significant improvement in both cognitive and non-cognitive student learning outcomes. Indonesia's current accreditation system, employing the Education Unit Accreditation Instrument (IASP), emphasizes genuine data extraction through observation, interview, and digital document review via the SISPEN and Dapodik systems, intended to ensure accreditation results reflect authentic learning quality rather than mere paper-based document completeness. Accreditation itself has undergone significant transformation from a predominantly document-based, administrative-compliance orientation toward a data-based system, grounded in the recognition that accreditation should not merely assess formal compliance but should drive substantial improvement in schools' core education processes.

Mahakam Ulu Regency, situated in East Kalimantan Province's interior and border area and formally classified among Indonesia's frontier, outermost, and least-developed (3T) regions, presents distinctive characteristics directly relevant to this study. Information-technology infrastructure limitation, transportation-access constraint, and uneven educator human-resource distribution constitute critical variables shaping education-policy implementation in this setting. Data-based accreditation implementation in Mahakam Ulu accordingly demands accurate data synchronization amid limited internet signal and other supporting-facility constraints. A specific phenomenon motivates this study: some schools in Mahakam Ulu Regency have achieved favorable systemic accreditation status, yet this achievement does not necessarily correlate linearly with genuine learning-quality improvement, encompassing teacher effectiveness, student engagement, and learning outcomes. This apparent gap suggests that accreditation may, in some cases, remain regarded as an annual administrative ritual rather than an instrument for sustained instructional improvement, that high accreditation predicates (A or Unggul/Excellent) do not always correspond to fully optimal or data-driven classroom learning process and quality, and that accreditation-result utilization by schools sometimes stops at requirement fulfillment rather than extending to strategic curriculum or teaching-method improvement planning, motivating the need for empirical evidence measuring the extent to which data-driven accreditation recommendations genuinely influence teacher instructional behavior change and student learning-environment improvement in elementary and lower-secondary schools.

According to 2025 Basic Education Data (Dapodik) from the Directorate General of Early Childhood, Basic, and Secondary Education, State Elementary School 007 Mamahak Besar, this study's research site, held a C accreditation rating as of December 2021, alongside several other elementary schools in the regency similarly rated B or C, indicating that the school's accreditation status itself has not yet reached the highest tier, rendering it a particularly relevant case for examining how data-based accreditation implementation, notwithstanding a comparatively modest formal accreditation grade, relates to learning quality as experienced and assessed by the school's own principal and teachers.

Building on this rationale, this study aims to determine the effect of data-based accreditation implementation on learning quality and to identify the inhibiting factors in its implementation at State Elementary School 007 Mamahak Besar under the Education and Culture Office of Mahakam Ulu Regency.

This study's contribution is accordingly twofold: empirically, it provides a rigorously quantified account of data-based accreditation's effect on learning quality within a specific, underrepresented frontier-region setting; and practically, it offers concrete, stakeholder-specific recommendations, addressed to the principal, teachers, school operators, the Education and Culture Office, and school supervisors, for strengthening data-based accreditation practice in a manner responsive to Mahakam Ulu Regency's distinctive infrastructural and geographic conditions.

2. LITERATURE REVIEW

2.1 Education Quality Management and Public Policy

Education quality constitutes a multidimensional construct encompassing input, process, and output dimensions, requiring systematic management to ensure sustained improvement (Arifin, 2012). Sadhana (2011) frames education policy as a form of public policy in which government establishes binding decisions and instruments, such as accreditation regulation, to achieve broader social-welfare and human-capital-development objectives, positioning school accreditation not merely as a technical evaluative exercise but as a concrete manifestation of national education public policy translated into education-unit-level practice. Ngarawula (2024) further situates such policy instruments within public-administration theory, emphasizing that effective policy implementation depends on the interaction among regulatory design, institutional capacity, and the specific socioeconomic and geographic context in which implementation occurs, a consideration directly relevant to this study's frontier-region research setting.

2.2 School Accreditation: From Document Compliance to Data-Based Evaluation

School accreditation constitutes an external quality-assurance instrument assessing education-unit feasibility and quality against national standards. Arikunto (2018) frames education evaluation broadly as a systematic process for determining the extent to which educational objectives have been achieved, a foundational logic underlying accreditation's evolution in Indonesia. The Indonesian accreditation system, administered by the National Accreditation Board for Early Childhood, Basic, and Secondary Education (BAN-PDM), previously known as BAN-S/M, has evolved substantially from an administratively oriented model emphasizing document and physical-facility completeness toward a more comprehensive model referencing National Education Standards (BAN-S/M, 2023; BSNP, 2020). This evolution reflects growing recognition that accreditation should assess not only formal compliance but genuine institutional performance, including student learning outcomes, learning-process quality, and school management effectiveness (BAN-PDM, 2024).

2.3 Data-Based Decision Making in Education

Data-based decision making (DBDM) constitutes a central theoretical foundation for understanding data-based accreditation's mechanism of influence on learning quality. Schildkamp (2019) explains that data-based decision making in education extends beyond summative assessment data alone to encompass diverse evidentiary sources principals, teachers, and students can draw upon to support school improvement, a proposition further elaborated by Mandinach and Schildkamp (2021), who characterize DBDM as an inherently complex process requiring not only data availability but organizational capacity, data literacy, and a supportive school culture for data to be genuinely translated into improved practice. Gelderblom *et al.*, (2016), examining data-based decision making for instructional improvement in primary education specifically, find that structured data use meaningfully supports instructional-quality enhancement when accompanied by adequate teacher data-interpretation capacity, a precondition this study's findings regarding teacher data-literacy limitation directly engage. Visscher (2021), synthesizing evidence from six intervention studies, similarly concludes that data-based decision making generates genuine educational value only when data use is embedded within a sustained, supported organizational process rather than treated as an isolated technical exercise. Hamilton *et al.*, (2009), in a widely referenced practice guide, further affirm that using student-achievement data to support instructional decision-making requires building a school-wide culture in which data-driven inquiry is normalized as routine practice rather than confined to accreditation cycles, a distinction directly relevant to this study's finding that data utilization risks remaining an administrative-compliance exercise absent sustained institutional

reinforcement. The Organization for Economic Co-operation and Development (OECD, 2020) reinforces this proposition at a system level, finding across member countries that using data to improve school outcomes requires coherent alignment among data infrastructure, educator capacity, and school-leadership support,

precisely the three dimensions this study's Indonesian frontier-region case examines empirically.

2.4 Prior Research

Table 1 summarizes prior studies most directly relevant to this study's focus on accreditation, data utilization, and learning quality.

Table 1: Summary of Prior Studies on Accreditation, Data Utilization, and Learning/Education Quality

Study	Focus	Key Finding
Suryani (2020)	School accreditation status and student achievement, junior secondary schools	Accreditation status significantly affects student learning achievement; higher-accredited schools show better learning outcomes
Hidayat (2019)	School accreditation and teacher performance	A positive relationship exists between school accreditation and teacher performance, a key determinant of learning quality
Pratama & Wibowo (2022)	National Education Standards fulfillment and learning quality (SEM approach)	National Education Standards fulfillment, as an accreditation indicator, significantly affects learning quality
Lestari & Putra (2023)	Education-data utilization and learning quality	Education-data utilization significantly affects learning effectiveness, directly relevant to data-based accreditation
Wahyuni (2022)	Data-based evaluation and school quality	Data-based evaluation and planning, including through education quality reports, sustainably improve school quality
Ningsih (2023)	Education quality reports (Rapor Pendidikan) and school-quality improvement	Utilization of education quality reports contributes to sustained school-quality improvement
Badu & Cahyono (2022)	Data-Based Planning (PBD) implementation, West Java	Data-based planning implementation supports education-quality improvement when accompanied by adequate institutional data-management capacity

Source: Synthesized by the author from the reviewed literature.

These studies collectively affirm that accreditation and education-data utilization hold a significant relationship with learning quality and broader education quality. This study extends that literature by examining data-based accreditation's effect on learning quality specifically within a single, comprehensively surveyed elementary school in a frontier, outermost, and least-developed region, a research configuration combining data-based-accreditation specificity with 3T-region geographic and infrastructural constraint not extensively examined in the reviewed comparator studies, most of which are conducted in more infrastructurally developed settings.

2.5 Correlates of Learning Quality: Governance, Digitalization, and School Management

Beyond data-based decision making specifically, learning quality has been linked to a broader set of governance and management factors relevant to interpreting this study's unexplained variance. Firmansyah (2021) finds that quality-assurance systems significantly affect education quality more broadly, reinforcing accreditation's role as one mechanism among several shaping school performance. Rahmawati (2021) similarly demonstrates that school-based management significantly affects education quality, suggesting that managerial autonomy and local decision-making capacity, dimensions distinct from data-based

accreditation per se, constitute an important complementary determinant of learning outcomes. Setiawan (2020) further finds that education digitalization significantly affects learning effectiveness, a finding directly relevant to this study's identification of digital-facility and internet-connectivity constraint as a persistent inhibiting factor, since digitalization's benefits for data-based accreditation implementation cannot be separated from the underlying technological infrastructure required to sustain it. Snyder and D'Amico (2017), writing on the theory and practice of learning quality more broadly, caution that learning quality is inherently multidimensional, encompassing cognitive, social, and institutional dimensions that no single policy instrument, including accreditation, can be expected to fully determine, a caution this study's own coefficient of determination, explaining just over half of learning-quality variance, empirically corroborates.

2.6 Conceptual Framework and Hypothesis

Building on the data-based decision-making literature reviewed above, this study conceptualizes data-based accreditation implementation (Variable X) as encompassing six indicators: school-data availability, data validity and currency, education-report utilization, accreditation-document completeness, accreditation follow-up management, and resource and facility support. Learning quality (Variable Y) is conceptualized

through indicators spanning curriculum-consistent learning planning, directed learning implementation, learning method and media use, active student engagement, learning assessment, and learning-outcome follow-up through remediation, enrichment, reflection, and supervision. This study accordingly tests the hypothesis that data-based accreditation implementation has a positive and significant effect on learning quality at State Elementary School 007 Mamahak Besar.

3. RESEARCH METHODS

3.1 Research Approach

This study employed an associative quantitative approach with a survey method, following Sugiyono's (2019) characterization of associative research as directed toward determining the relationship between two or more variables, selected because the research objective is to test whether data-based accreditation implementation (Variable X) exerts a measurable effect on learning quality (Variable Y).

3.2 Population and Sample

The study population comprised the principal and teachers of State Elementary School 007 Mamahak Besar. The sample was drawn using purposive sampling, selecting the school principal, who possesses direct understanding of the accreditation process, and actively teaching classroom teachers, yielding a total sample of 16 respondents.

3.3 Research Instrument

The research instrument comprised two variables, data-based accreditation implementation (X) and learning quality (Y), each measured through 24 statement items on a five-point Likert scale. Variable X's instrument was structured around six indicators, school-data availability, data validity and currency, education-report utilization, accreditation-document completeness, accreditation follow-up management, and resource and facility support, while Variable Y's instrument was structured around indicators spanning learning planning, implementation, method and media use, student engagement, assessment, and outcome follow-up. Instrument validity was assessed using Pearson Product-Moment correlation, correlating each item score against the total score, with an item deemed valid where the calculated r-value exceeded the table r-value at the 5 percent significance level.

3.4 Data Collection Technique

Data were collected through a structured questionnaire administered to all 16 respondents, direct observation of learning-process and accreditation-related activity at the research site, documentation review encompassing school accreditation records and Dapodik data, and supporting interviews used to contextualize and deepen understanding of the quantitative survey findings.

3.5 Data Analysis Technique

Data were analyzed through three complementary techniques. Likert-scale and percentage analysis converted raw item scores into indicator- and variable-level percentage indices, interpreted against standard categorization ranging from very poor to very good. Simple linear regression analysis, following the formula $b = (n\sum XY - \sum X \sum Y) / (n\sum X^2 - (\sum X)^2)$, determined the functional relationship between Variable X and Variable Y, yielding a regression equation, correlation coefficient, and coefficient of determination. Hypothesis testing employed a t-test on the regression coefficient at the 5 percent significance level, with degrees of freedom $(df) = n - 2 = 14$, comparing the calculated t-value against the table t-value of approximately 2.145 to determine statistical significance.

4. RESULTS

The results are presented in four stages: first, a brief institutional profile of the research site; second, descriptive results for each of the study's two variables; third, the simple linear regression and hypothesis-testing results; and fourth, the inhibiting factors identified through supporting interview data, before proceeding to a discussion interpreting these findings against the literature reviewed in Section 2.

4.1 School Profile

State Elementary School 007 Mamahak Besar operates under the Education and Culture Office of Mahakam Ulu Regency, East Kalimantan Province, a regency formally classified among Indonesia's frontier, outermost, and least-developed (3T) regions. According to 2025 Dapodik data, the regency's elementary schools held accreditation ratings predominantly at the B level, with several schools, including SDN 007 Mamahak Besar, rated C, reflecting the broader regional education-quality context within which this study's findings should be interpreted.

4.2 Descriptive Results: Data-Based Accreditation Implementation (Variable X)

Variable X, data-based accreditation implementation, obtained a total score of 1,665 out of an ideal score of 1,920, yielding a percentage of 86.72 percent, falling within the very good category. This result indicates that SDN 007 Mamahak Besar has achieved strong readiness in implementing data-based accreditation. Among the instrument's six indicators, school-data availability scored 279 out of an ideal 320 (87.19 percent), also falling within the very good category, with other indicators, including data validity and currency, education-report utilization, accreditation-document completeness, accreditation follow-up management, and resource and facility support, likewise falling predominantly within the very good to good range, consistent with the overall Variable X score.

The remaining five indicators of Variable X similarly demonstrated strong performance: data validity and currency, reflecting the school's periodic updating of Dapodik and internal records, scored within the very good range; education-report utilization, reflecting the extent to which the school's leadership and teachers actively consulted the annual education quality report (Rapor Pendidikan) in planning improvement activity, likewise scored favorably, though marginally below the indicator average, consistent with the teacher data-literacy limitation identified among this study's inhibiting factors; accreditation-document completeness scored highest among all six indicators, reflecting the school's sustained administrative preparation for accreditation review; accreditation follow-up management, capturing whether accreditation recommendations were translated into concrete school-improvement action, scored in the good-to-very-good range; and resource and facility support, capturing the availability of personnel, budget, and physical infrastructure underpinning data-based accreditation activity, scored somewhat lower than the other five indicators, foreshadowing this study's later identification of digital-facility and connectivity constraint as a persistent inhibiting factor.

4.3 Descriptive Results: Learning Quality (Variable Y)

Variable Y, learning quality, obtained a total score of 1,721 out of an ideal score of 1,920, yielding a percentage of 89.64 percent, falling within the very good category, marginally higher than Variable X's score. This

result is reflected in curriculum-consistent learning planning, directed learning implementation, active student engagement, and consistent learning assessment and follow-up through remediation, enrichment, reflection, and supervision, as reported by both the principal and teacher respondents.

Among Variable Y's underlying indicators, active student engagement and curriculum-consistent learning planning scored highest, reflecting teachers' sustained effort to design lessons aligned with prevailing curriculum standards while maintaining student participation and interest. Learning method and media use scored somewhat lower, consistent with the facility and internet-connectivity constraints identified among this study's inhibiting factors, since technology-supported instructional media depend on the same infrastructural conditions shown to constrain Variable X's resource and facility indicator. Learning-outcome follow-up through remediation, enrichment, reflection, and supervision scored in the good-to-very-good range, indicating that assessment results are, to a meaningful extent, translated into concrete instructional adjustment, though this study's inhibiting-factor analysis in Section 4.5 suggests this follow-up process would benefit from greater consistency and depth.

4.4 Simple Linear Regression Results

Table 2 summarizes the recapitulation of Variable X and Y scores across all 16 respondents, forming the basis for the regression calculation.

Table 2: Recapitulation of Variable X and Y Scores (N = 16)

Statistic	Value
Sum of Variable X scores (ΣX)	1,665
Sum of Variable Y scores (ΣY)	1,721
Sum of X^2 (ΣX^2)	174,719
Sum of Y^2 (ΣY^2)	186,785
Sum of XY (ΣXY)	180,276

Source: Research results (2026).

Based on this recapitulation, simple linear regression analysis yielded the equation $Y = 22.847 + 0.814X$, indicating that each one-unit increase in data-based accreditation implementation (X) is associated with a 0.814-unit increase in learning quality (Y). The positive regression coefficient indicates that stronger data-based accreditation implementation corresponds with higher learning quality at the school. This finding was reinforced by a correlation coefficient of 0.760, indicating a strong relationship between the two variables, and a coefficient of determination of 57.74 percent, indicating that data-based accreditation implementation accounts for 57.74 percent of the variance in learning quality, with the remaining 42.26 percent attributable to factors outside this study's variables, including teacher competence, principal leadership, learning-facility availability, student

motivation, academic supervision, school culture, and learning-environment support.

Hypothesis testing through a t-test on the regression coefficient yielded a calculated t-value of 4.374, exceeding the table t-value of 2.145 at the 5 percent significance level with 14 degrees of freedom. This result confirms that the effect of data-based accreditation implementation on learning quality is statistically significant, supporting the study's hypothesis and indicating that the observed learning-quality improvement is systematically associated with data-based accreditation implementation rather than occurring by chance.

4.5 Inhibiting Factors

Table 3 summarizes the principal factors identified as inhibiting data-based accreditation implementation at SDN 007 Mamahak Besar.

Table 3: Factors Inhibiting Data-Based Accreditation Implementation at SDN 007 Mamahak Besar

No.	Inhibiting Factor	Description
1	Limited teacher data literacy	Some teachers face difficulty reading, interpreting, and using education quality reports as a basis for learning-quality-improvement programming
2	Constrained digital facilities and internet connectivity	Unstable network access hinders data updating, synchronization, and upload processes
3	High teacher administrative workload	Teachers bear responsibility for learning delivery alongside instructional-tool preparation, assessment documentation, accreditation evidence, and follow-up reporting
4	Inconsistent evaluation follow-up	Remediation, enrichment, reflection, and academic supervision require further strengthening to ensure accreditation results genuinely translate into learning-quality improvement
5	Limited sustained technical mentoring	The school requires continuous guidance from the Education Office and school supervisors for more systematic data management and quality-report utilization

Source: Survey and supporting interview data, compiled by the researcher (2026).

5. DISCUSSION

5.1 A Significant Effect within a Frontier-Region Context

This study's central finding, a significant positive effect of data-based accreditation on learning quality ($b = 0.814$, $r = 0.760$, $R^2 = 57.74$ percent, $t = 4.374 > t\text{-table} = 2.145$), is consistent with the broader data-based decision-making literature, particularly OECD's (2020) cross-national finding that data use meaningfully improves school outcomes where accompanied by adequate data infrastructure and educator capacity. This study's specific contribution lies in demonstrating that this relationship holds even within a frontier, outermost, and least-developed regency where such infrastructure and capacity are, by this study's own findings, only partially established, suggesting that data-based accreditation's positive effect on learning quality may be somewhat robust to infrastructural constraint, provided a baseline level of school-level data engagement is achieved.

5.2 The Explained-Unexplained Variance Divide: What the 42.26 Percent Represents

The coefficient of determination indicates that data-based accreditation implementation explains 57.74 percent of learning-quality variance, leaving 42.26 percent attributable to factors outside this study's model. Read alongside Hamilton et al.'s (2009) emphasis on school-wide data-culture normalization, this substantial unexplained variance suggests that data-based accreditation functions as a necessary but insufficient condition for learning-quality improvement: teacher competence, principal leadership, facility availability, and academic supervision, factors this study's discussion of inhibiting factors directly implicates, plausibly account for much of this remaining variance, reinforcing Mandinach and Schildkamp's (2021) caution that data-based decision making's complexity extends well beyond data availability alone to encompass organizational and human-capacity dimensions this study's regression model does not directly measure.

5.3 The Accreditation-Grade Paradox: Strong Implementation, Modest Formal Status

This study's most distinctive contextual finding is the coexistence of very good data-based accreditation implementation (86.72 percent) and very good learning quality (89.64 percent), as assessed by the school's own principal and teachers, with the school's comparatively modest formal accreditation grade of C as recorded in 2025 Dapodik data. This divergence directly illustrates the research-gap concern articulated in Section 1, that formal accreditation status does not always correlate linearly with genuine learning-quality improvement, and suggests that SDN 007 Mamahak Besar may represent a case in which internal data-based improvement processes have progressed meaningfully even where the school's aggregate formal accreditation rating has not yet been correspondingly updated or elevated, a pattern consistent with accreditation cycles' inherent time lag relative to ongoing internal school-improvement effort.

5.4 Infrastructure Constraint as a Distinctive 3T-Region Consideration

The inhibiting factors identified, particularly constrained digital facilities and unstable internet connectivity, are consistent with the structural challenge Mahakam Ulu Regency's frontier, outermost, and least-developed classification implies, distinct from the infrastructural conditions typically assumed in the predominantly urban and developed-country data-based decision-making literature reviewed in Section 2.3. This finding reinforces Visscher's (2021) proposition that data-based decision making generates genuine value only within a sustained, supported organizational process, a support structure this study's findings suggest requires deliberate infrastructural investment in frontier-region settings specifically, rather than being assumed as a baseline condition.

5.5 Comparison with Prior Studies

These findings both corroborate and extend the prior literature summarized in Table 1. Consistent with Suryani (2020) and Hidayat (2019), this study confirms that accreditation-related factors hold a significant positive relationship with learning-related outcomes.

Consistent with Lestari and Putra (2023) and Wahyuni (2022), this study confirms that education-data utilization significantly affects learning quality and effectiveness. Consistent with Pratama and Wibowo (2022), National Education Standards fulfillment, embedded within the data-based accreditation construct this study examines, is confirmed as a significant learning-quality determinant. The study extends this literature by providing a precise, quantified effect size ($R^2 = 57.74$ percent) within a single frontier-region elementary school, a level of contextual specificity and geographic setting not present in the reviewed comparator studies, most of which examine accreditation-quality relationships in more infrastructurally developed or aggregated multi-school settings.

5.6 Situating the Finding within Broader School-Management Correlates

Consistent with Firmansyah's (2021) and Rahmawati's (2021) findings that quality-assurance systems and school-based management significantly shape education quality, and Setiawan's (2020) finding that digitalization significantly affects learning effectiveness, this study's 42.26 percent unexplained variance is plausibly distributed across precisely these adjacent governance and technological dimensions, school-based managerial capacity, principal leadership, and digital-infrastructure adequacy, rather than reflecting a weakness in the data-based accreditation construct itself. Read through Snyder and D'Amico's (2017) caution that learning quality resists full explanation by any single institutional instrument, this study's R^2 of 57.74 percent should accordingly be read as a substantial, rather than complete, explanatory contribution, consistent with what a multidimensional understanding of learning quality would predict rather than a limitation specific to this study's design or measurement.

6. CONCLUSION

6.1 Summary of Findings

This study examined the effect of data-based accreditation implementation on learning quality at State Elementary School 007 Mamahak Besar, Mahakam Ulu Regency. Data-based accreditation implementation was categorized as very good (86.72 percent), as was learning quality (89.64 percent). Simple linear regression confirmed a positive, statistically significant effect of data-based accreditation on learning quality ($Y = 22.847 + 0.814X$; $r = 0.760$; $R^2 = 57.74$ percent; $t = 4.374 > t_{\text{table}} = 2.145$). Data-based accreditation contributed to learning-quality improvement through school-data availability, education-report utilization, accreditation-document completeness, evaluation follow-up, and resource support, while implementation continued to face inhibiting factors including limited teacher data literacy, constrained digital facilities and internet connectivity, teacher administrative workload,

inconsistent evaluation follow-up, and the need for sustained technical mentoring.

6.2 Theoretical Implications

This study reinforces the data-based decision-making literature's central proposition that data use meaningfully improves education outcomes when embedded within a supported organizational process, while extending that literature by quantifying this relationship's effect size within a frontier-region elementary school and by documenting an accreditation-grade paradox, strong internally assessed data-based implementation and learning quality coexisting with a comparatively modest formal accreditation rating, that highlights the potential time lag between ongoing school-level improvement effort and periodic external accreditation cycles.

6.3 Practical Implications

For the principal, the findings support sustaining and institutionalizing data-based accreditation practice as part of the school's ongoing quality culture, ensuring school data, education quality reports, supervision results, student assessment outcomes, and learning-evaluation documents are used consistently, beyond accreditation periods alone, as the basis for quality-improvement programming, supported by regular direction, mentoring, and oversight of teachers and school operators. For teachers, the findings support strengthening capacity in compiling, managing, and utilizing learning data, including systematic documentation of instructional tools, assessment results, remediation, enrichment, and learning reflection, using student-assessment outcomes as the basis for refining instructional strategy, method, and media. For school administrative operators, the findings support continued precision in managing, updating, and synchronizing school data within prevailing education-data systems, given data-based accreditation's fundamental dependence on data quality. For the Education and Culture Office of Mahakam Ulu Regency, the findings support providing sustained technical mentoring in accreditation-data management, education-quality-report utilization, quality-document preparation, and evaluation follow-up, formalized as a routine mentoring program rather than confined to pre-accreditation periods alone. For school supervisors, the findings support strengthening both academic and managerial supervisory function, extending beyond administrative-completeness inspection toward substantive teacher mentoring in learning-quality improvement, quality-data interpretation, and improvement-plan formulation. For the school specifically, the findings support developing a more organized documentation system, encompassing accreditation data archives, instructional tools, supervision results, evaluation documents, and learning follow-up evidence, alongside strengthened digital facilities and internet connectivity to support more effective data management.

6.4 Limitations of the Study

This study is subject to several limitations. First, it is confined to a single elementary school with 16 respondents, meaning its findings cannot be generalized to other schools' data-based accreditation implementation without further comparative research involving a larger, multi-school sample. Second, the associative quantitative design tests linear relationship between two variables without incorporating additional factors, such as principal leadership, teacher competence, or academic supervision, that this study's own discussion identifies as plausible contributors to the substantial unexplained variance. Third, the cross-sectional design captures implementation and learning-quality conditions at a single point in time, limiting this study's capacity to fully explain the accreditation-grade paradox identified in Section 5.3, which would benefit from longitudinal tracking of accreditation-cycle timing relative to internal improvement effort.

6.4a Reflections on the Frontier-Region Setting

Beyond its specific statistical findings, this study's broader value lies in documenting that a frontier, outermost, and least-developed regency school can achieve meaningful, measurable data-based-accreditation implementation notwithstanding acknowledged infrastructural constraint, offering an evidentiary counterpoint to any assumption that data-based education reform is inherently infeasible in Indonesia's most geographically challenging regions. This finding carries encouraging implications for national education-policy design, suggesting that continued investment in frontier-region digital infrastructure and teacher data literacy, rather than a retreat from data-based accreditation's ambitions in such settings, represents the more promising path toward closing Indonesia's persistent inter-regional education-quality gap.

6.5 Recommendations for Future Research

Future research is encouraged to expand the respondent sample and involve multiple elementary schools across Mahakam Ulu Regency, enhancing generalizability. Future studies could also incorporate additional variables, including principal leadership, teacher competence, academic supervision, school quality culture, or learning facilities, to develop a more comprehensive explanatory model. A mixed-methods approach combining quantitative and qualitative analysis would further enable deeper examination of how data-based accreditation influences learning quality, while longitudinal research tracking schools across multiple accreditation cycles could help resolve the accreditation-grade paradox this study identifies but cannot fully explain within its cross-sectional design.

Taken as a whole, the SDN 007 Mamahak Besar case suggests that data-based accreditation can generate a significant, substantial positive effect on learning quality even within a frontier, outermost, and

least-developed regional context, provided schools engage meaningfully with data as a foundation for reflection and improvement rather than treating it as a periodic administrative requirement, while underscoring that sustained learning-quality gains ultimately depend on complementary investment in teacher capacity, infrastructure, and continuous institutional support beyond the accreditation instrument itself.

REFERENCES

- Arifin, A. (2012). *Manajemen mutu pendidikan*. Diva Press.
- Arikunto, S. (2018). *Dasar-dasar evaluasi pendidikan*. Bumi Aksara.
- Badan Akreditasi Nasional Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah. (2024). *Badan Akreditasi Nasional Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah*. <https://ban-pdm.id/>
- Badan Akreditasi Nasional Sekolah/Madrasah. (2023). *Pedoman akreditasi sekolah/madrasah berbasis data*. BAN-S/M.
- Badan Standar Nasional Pendidikan. (2020). *Standar nasional pendidikan dan penjaminan mutu*. BSNP.
- Badu, T. K., & Cahyono, H. (2022). Implementasi Perencanaan Berbasis Data (PBD) dalam peningkatan mutu pendidikan di Jawa Barat. *Jurnal Manajemen Pendidikan*, 15(1), 45-58.
- Firmansyah, A. (2021). Pengaruh sistem penjaminan mutu terhadap kualitas pendidikan. *Jurnal Manajemen Pendidikan*, 12(2), 115-126.
- Gelderblom, G., Schildkamp, K., Pieters, J., & Ehren, M. (2016). Data based decision making for instructional improvement in primary education. *International Journal of Educational Research*, 80, 1-14. <https://doi.org/10.1016/j.ijer.2016.07.004>
- Hair, J. F., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson Education.
- Hamilton, L., Halverson, R., Jackson, S. S., Mandinach, E., Supovitz, J. A., & Wayman, J. C. (2009). *Using student achievement data to support instructional decision making* (NCEE 2009-4067). National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
- Hidayat, R. (2019). Hubungan akreditasi sekolah dengan kinerja guru. *Jurnal Pendidikan dan Evaluasi Pendidikan*, 10(1), 45-58.
- Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2023). *Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 38 Tahun 2023 tentang Akreditasi Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah*.
- Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2024). *Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 12 Tahun 2024 tentang Kurikulum*

pada Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, dan Jenjang Pendidikan Menengah.

- Kementerian Pendidikan Dasar dan Menengah Republik Indonesia. (2025). *Tentang Perencanaan Berbasis Data (PBD)*. Rumah Pendidikan.
- Lestari, D., & Putra, A. (2023). Pengaruh pemanfaatan data pendidikan terhadap kualitas pembelajaran. *Jurnal Teknologi Pendidikan*, 15(2), 134-145.
- Mandinach, E. B., & Schildkamp, K. (2021). The complexity of data-based decision making: An introduction to the special issue. *Studies in Educational Evaluation*, 69, 100906. <https://doi.org/10.1016/j.stueduc.2020.100906>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. SAGE Publications.
- Ngarawula, B. (2024). *Teori administrasi publik*. CV Putra Surya Santosa.
- Ningsih, S. (2023). Pengaruh rapor pendidikan terhadap peningkatan mutu sekolah. *Jurnal Kebijakan Pendidikan Indonesia*, 8(1), 67-79.
- Organisation for Economic Co-operation and Development. (2020). *Using data to improve school outcomes*. OECD Publishing.
- Pratama, R., & Wibowo, H. (2022). Pengaruh standar nasional pendidikan terhadap mutu pembelajaran menggunakan pendekatan SEM. *Jurnal Penelitian Pendidikan*, 14(1), 89-102.
- Rahmawati, I. (2021). Pengaruh manajemen berbasis sekolah terhadap mutu pendidikan. *Jurnal Administrasi Pendidikan*, 13(2), 101-112.
- Republik Indonesia. (2003). *Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional*.
- Sadhana, K. (2011). *Realitas kebijakan publik*. UM Press.
- 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>
- Setiawan, B. (2020). Pengaruh digitalisasi pendidikan terhadap efektivitas pembelajaran. *Jurnal Inovasi Pendidikan*, 11(2), 77-88.
- Sholahuddin, A. (2021). *Metodologi penelitian sosial: Perspektif kualitatif-kuantitatif*. Edulitera.
- Snyder, J., & D'Amico, L. (2017). *Quality of learning: Theory and practice*. Routledge.
- Sugiyono. (2019). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.
- Suryani, L. (2020). Pengaruh status akreditasi terhadap prestasi belajar siswa SMP. *Jurnal Evaluasi Pendidikan*, 9(1), 55-66.
- Veeger, K. J. (2003). *Metode penelitian sosial*. Gramedia Pustaka Utama.
- Visscher, A. J. (2021). On the value of data-based decision making in education: The evidence from six intervention studies. *Studies in Educational Evaluation*, 69, 100899. <https://doi.org/10.1016/j.stueduc.2020.100899>
- Wahyuni, S. (2022). Pengaruh evaluasi berbasis data terhadap mutu sekolah. *Jurnal Pendidikan dan Kebijakan Publik*, 7(2), 120-132.

Cite This Article: Baweq, B., Sukardi, & Adi, D. S. (2026). From Numbers to Nurture: Data-Based Accreditation and Learning Quality in a Frontier Elementary School, East Kalimantan, Indonesia. *East African Scholars J Edu Humanit Lit*, 9(9), 538-547. <https://doi.org/10.36349/easjehl.2026.v09i09.002>
