

Educational Supervision with Scientific Methods in Improving Student Learning Outcomes and the Performance of High-Achieving Teachers

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ABSTRACT

The implementation of educational supervision with scientific methods in improving student learning outcomes and the performance of outstanding teachers at the elementary education unit level in Rejang Lebong Regency includes problems that occur, namely the implementation of educational supervision is rarely carried out so that it results in the teaching and learning process not being in accordance with the provisions and not achieving learning objectives, this decreases student learning outcomes and decreases teacher performance so that the purpose of this study is to provide knowledge and concepts about the importance of implementing educational supervision using scientific methods in improving student learning outcomes as well as improving teacher performance so that teachers achieve at the educational unit level. The research methodology used is using case studies, namely to explore in depth several phenomena that are located in a natural context, of course educational supervision activities that have been carried out at the educational unit level and data collection techniques used are interviews, observation and documentation through the stages of problem identification, case selection, data collection, case studies, data analysis, data organization, and presentation of data results. The research results have found that the implementation of educational supervision using scientific methods is rarely carried out at the educational unit level, this reduces student learning outcomes and teacher performance, resulting in the lack of achievement of educational goals, so the recommendation given by researchers is that it is important to carry out educational supervision activities using scientific methods on an ongoing basis in the form of seeing the extent to which student learning outcomes are achieved and improving teacher performance so that teachers can become high-achieving teachers in Rejang Lebong Regency.

Keywords: Educational Supervision, Scientific Method, Learning Outcomes, High-Achieving Teacher Performance

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PENDAHULUAN

Educational supervision has evolved from an administrative model to a professional development model that emphasizes evidence-based learning (Fatkhani, 2021). According to GusGus (1998), supervision should be a cyclical process of planning, action, evaluation, and reflection so that the process can be repeated continuously. The application of scientific methods to supervision allows for data-supported decisions, reduces subjectivity, and increases accountability (Shulman, 2005).

Educational supervision can be understood through several main models described by experts. The conventional model emphasizes control and monitoring, often with an authoritarian nature (Sahertian, 2000). The scientific model promotes the use of objective data such as classroom observations, student grades, and teacher performance as the basis for planning and implementing supervision (Fatkhani, 2021). The clinical model emphasizes a routine cycle involving observation, analysis, and evaluation to bridge the gap between existing and ideal teaching practices (Mulyasa, 2003). The artistic model highlights the importance of interpersonal skills, creativity, and "art" in motivating teachers to change (Fatkhani, 2021).

Scientific Method in Educational Supervision with stages: Problem Identification. Initial observation to detect gaps between teacher competencies and learning standards (Fatkhan, 2021). Formulate SMART-based research questions (Specific, Measurable, Achievable, Relevant, Time-bound). Hypothesis Development. Research Design. Choose a quasi-experimental or case study design, depending on the school context (Creswell, 2014). Determine the independent (learning strategies) and dependent (learning outcomes) variables. Data Collection. Observation checklist instruments, assessment rubrics, formative tests, self-assessment questionnaires. Procedures: classroom observation, video recording, pre- and post-intervention testing.

Data Analysis Descriptive analysis (mean, sd) and inferential analysis (t-test, ANOVA) to test the hypothesis (Field, 2013). Data triangulation to increase validity (Denzin, 1978). Interpretation and Diagnosis Compare results with competency standards; identify inhibiting and supporting factors. Feedback and Action Plan. Preparation of evidence-based reports, reflective discussions with teachers, and determination of improvement strategies (Gus, 1998). Follow-up Implementation. Implementation of action plans, ongoing monitoring, and recording of changes. Evaluation and Re-iteration. Final evaluation to assess impact; the cycle begins again with a new research question (Shulman, 2005).

Ethical Considerations in Educational Supervision: Data Confidentiality – Observation data and recordings must be kept secure and accessible only to authorized supervisory teams (American Psychological Association, 2020). Informed Consent – Teachers must sign consent before videotaping or interviews are conducted. Non-judgmental Stance – Focus on development, not judgment; avoid offensive language. Workload Balance – Ensure supervision does not add an unrealistic workload (Birkeli & Rø, 2023).

Practical implications of educational supervision using scientific methods: Transparency: All steps are documented, facilitating internal audits (Mertler, 2017). Collaboration: Teachers are involved in planning and evaluation, increasing ownership (Gus, 1998). Continuous Professional Development: Supervision data serves as the basis for further training (Shulman, 2005). The application of scientific methods to educational supervision results in a systematic, evidence-based, and repeatable process. By following structured steps from problem identification to evaluation, supervisors can provide credible feedback, optimize teaching practices, and ultimately improve student achievement. This approach aligns with the modern supervision paradigm, which emphasizes collaboration, critical reflection, and accountability (Fatkhan, 2021).

The integration of scientific methods into educational supervision results in a structured, objective, and repeatable process. By following the steps of problem identification, hypothesis formulation, research design, and evaluation and iterative cycles, supervisors can provide credible feedback, optimize teaching practices, and ultimately improve student achievement. This approach aligns with modern models of conventional, scientific, clinical, and artistic supervision, which collectively emphasize the importance of collaboration, critical reflection, and accountability in advancing educational quality (Fatkhan, 2021; Shulman, 2005).

Educational supervision carried out in educational units in Rejang Lebong Regency is carried out by supervisors from the Rejang Lebong Regency Education Office and school principals, who also serve as supervisors. Educational supervision can be carried out using scientific methods, but this is rarely done, especially in elementary education units, both by supervisors and internal supervisors, namely school principals. This can result in a decline in teacher performance and student learning outcomes.

How educational supervision using scientific methods is carried out in elementary education units in Rejang Lebong Regency, how educational supervision using scientific methods can improve student learning outcomes and the performance of high-achieving teachers in elementary education units in Rejang Lebong Regency and has the aim of knowing and finding the concept of implementing educational supervision using scientific methods that can improve student learning outcomes and the performance of high-achieving teachers at the elementary education unit level in Rejang Lebong Regency.

Supervision activities using scientific methods are a very important task that must be carried out by external supervisors, namely from the education office and internal supervisors from schools because supervision activities that are rarely carried out will result in a decline in the performance of educators and have an impact on declining learning achievement in students. Problem identification activities are also rarely carried out in schools, especially in elementary education units in terms of observing learning achievement data, then planning must be carried out well and systematically until the collection and analysis of data after the activity is carried out. This is what is the problem found by researchers which should be immediately corrected, one of the efforts is by conducting this research.

The problems found are how educational supervision using scientific methods is carried out in elementary education units in Rejang Lebong Regency, how educational supervision using scientific methods can improve student learning outcomes and the performance of high-achieving teachers in elementary education units in Rejang Lebong Regency and has the aim of knowing and finding the concept of implementing educational supervision using scientific methods that can improve student learning outcomes

and the performance of high-achieving teachers at the elementary education unit level in Rejang Lebong Regency.

METHOD

The research method used is a case study to deeply explore one or more phenomena situated in their natural context (Yin, 2018). This approach is used to explain complex mechanisms or processes. It examines the socio-cultural context that influences practices such as educational supervision and school policies. It produces generative theory rooted in field data, rather than simply testing existing hypotheses.

Planning Stage: Problem Identification and Research Objectives: Researchers formulate open-ended research questions. Objectives are defined descriptively (to understand the phenomenon) or interpretively (to interpret meaning). **Literature Review:** Relevant literature (books, journal articles, policies) is scanned to identify unanswered gaps. A conceptual framework is constructed, involving, for example, the following variables: supervisor role, teacher motivation, and learning outcomes (Creswell & Plano Clark, 2018).

Case Selection and Unit of Analysis Case studies can be intrinsic (a unique case), instrumental (a case as a tool to understand a theory), or multiple (several cases for comparison) (Stake, 1995). The researcher explains the selection criteria (e.g., schools with medium accreditation, principals willing to collaborate). Written consent from all participants (teachers, principals, parents if students are involved) and assurances of confidentiality and anonymity of the data must be obtained.

Data Collection Qualitative case studies rely on triangulation of data sources to enhance credibility. Some techniques used include: In-depth (semi-structured) interviews with supervisors, teachers, and principals. Participatory observation in the classroom or supervision room, documented in field notes. Documentation of lesson plans, supervision reports, reflection notes, photographs, or videos. Focus Group Discussions (FGDs) to stimulate discussion among teachers about their supervision experiences. Data collection is usually iterative (e.g., before, during, and after the intervention) so researchers can track dynamic changes.

Data Analysis Organizing Data Interview transcripts, observation notes, and documents are uploaded to qualitative analysis software (e.g., NVivo, Atlas.ti) or organized manually. **Validity (Trustworthiness)** According to Lincoln & Guba (1985), the validity of a case study is achieved through **Credibility** (internal validity): triangulation, member checking, and audit trail. **Transferability** (external validity): providing a rich description of the context so that readers can assess relevance to other situations. **Dependability** (reliability): detailed documentation of research procedures. **Confirmability** (objectivity): use of reflective journals and tracing analytical decisions.

RESULT AND DISCUSSION

The implementation of educational supervision using scientific methods that have been studied by researchers, namely at the SD Literasi Qur'ani in Rejang Lebong Regency with processes or stages that are in accordance with scientific methods. The methods used in educational supervision have several stages, including planning. In this planning, the main focus is the preparation of a learning implementation plan or teaching module that will be delivered to students. The focus is on increasing the use of problem-based learning methods.

The material is Islamic Religious Education, the goal is to use the SMART method, namely Specific, Measurable, Achievable / Attainable, Relevant / Realistic, Time-bound, where in 3 months according to observations made by researchers, students implemented the learning process well, where during the evaluation process, namely by evaluating the provision of questions to students, the questions were done well where students were able to achieve good grades in this case, the formative test, so this is an improvement from the observation instrument used by researchers, namely using an observation checklist with ten assessment rubric items, there are ten questions given, and a teacher self-assessment questionnaire.

The Islamic Religious Education learning plan at the SD Literasi Qur'ani emphasizes Islamic character development, competency-based learning, and inclusion. The goal is not merely to transfer knowledge, but to shape the attitudes, values, and behavior of customers, in this case students, that reflect a moderate, tolerant, and productive Islamic personality. The main components of the Islamic Religious Education Learning Implementation Plan at the Qur'ani Literacy Elementary School, supervision of the learning process using scientific methods, can produce observations including:

Component	Tree Content	Observation
Identity	Subjects, classes, semesters, time allocation, teachers, learning	Adjust to the competency standards of each subject.

	resources	
Competency Standards (SK) and Basic Competencies (KD)	Referring to the Merdeka curriculum document	Make sure SK/KD are measurable (SMART).
Learning objectives	State what students will do (cognitive, affective, psychomotor).	Use Bloom's level verbs (such as identify, analyze, practice).
Core Material	Topics of discussion at each meeting	Concise, relevant, and connected to the context of students' lives.
Learning Methods and Models	Storytelling, discussion, demonstration, cooperative learning, project-based learning.	Choose methods that support Islamic character values
Activity Steps	Introduction (activating prior knowledge). Core (presentation of material, exercises, reflection). Closing (resummarize, evaluate, pray).	Include inclusive activities for students with special needs.
Media & Learning Resources	Textbooks, teaching modules, animated videos, the Qur'an, digital applications (e.g. Smart Class).	Ensure that the media is based on Islamic values and is child-friendly.
Assessment	Formative (observation, short tests, portfolios) and summative (mid-term/final exams). Character assessment rubric (honesty, cooperation).	Use authentic assessments that measure real behavior.
Enrichment and Remedial	Extra activities for those who have mastered it and remedial material for those who have not.	Develop themes related to the surrounding environment (such as cleanliness, social awareness).
Teacher's Reflection	Implementation notes, obstacles, solutions, improvements for the next meeting.	Document for continuous improvement.

Learning Planning Stages Needs and Context Analysis: Student profile: age, literacy level, special needs. School environment: facilities, culture, parental support. Curriculum: mapping SK/KD with the Independent Curriculum and Islamic character values (tolerance, honesty, hard work). Objective and Indicator Design: Create objectives based on Bloom's Taxonomy and the affective domain (character). Determine observable achievement indicators. Method and Media Selection Choose active methods (Quran storytelling, role-play, project-based learning). Prepare visual media (posters, pictures of the Prophet), audio (recitation), and digital (Quran application).

Developing a Lesson Plan: Follow the standard Lesson Plan table structure (see example in the link above). Include a character assessment rubric and differentiation strategies. Implementation: Follow the Lesson Plan, remaining flexible and adapting to classroom dynamics. Document the process (photos, videos) for reflection. Evaluation and Reflection: Analyze the results of formative and summative assessments. Teacher reflection: what worked, what needs improvement, and follow-up plans.

Islamic Character Approach in Learning: Moral values (honesty, trustworthiness, patience) are used as affective learning outcomes. Practical activities: preparing a simple sahur meal, cleaning the school mosque, community service. Learning Model: Cooperative Learning (jigsaw, discussion groups) to foster mutual cooperation. Use of the Qur'an and Hadith as sources of values; for example: linking verses about justice with role-playing. Authentic and Character Assessment, namely:

Type of Assessment	Instrument	Focus Character
Class observation	Behavior checklist (maintaining cleanliness, respecting friends).	Responsibility, respect
Portfolio	A collection of works (short stories, value posters).	Creativity, honesty
Mini project	The Kindness Bazaar students sell used goods for charity.	Empathy, mutual cooperation
Written test	Multiple choice questions and short essays on Islamic values.	Knowledge and reflection

Start with a context analysis of who the students are, what their needs are, and what character values you want to instill. Formulate objectives and indicators that encompass both cognitive and affective aspects. Design a comprehensive lesson plan with active methods, Islamic media, and a character assessment rubric. Implement with flexibility and document the process. Conduct authentic evaluations and teacher reflections for continuous improvement.

After planning is carried out in educational supervision using scientific methods to see the learning outcomes of students or pupils as an indicator of achievement as well as improvements in teacher performance, there needs to be data collection. Data collection carried out during the supervision process includes supervisors or supervisors conducting class observations where in this observation process the supervisor makes three visits to the teaching and learning process that has taken place. Of course, in this process the supervisor notes that educators use lesson plans or teaching modules using PBL, namely problem-based learning.

Classroom observations conducted showed the interaction between teachers and students where in the learning process there were discussions and questions and answers so that not only teachers were active but students were also active in the supervision process carried out by supervisors. It was seen that teachers or educators were teaching Islamic religious education materials using media, namely laptops and infocus. Not only observations in the data collection process, this also used documentation techniques, namely taking photos of the whiteboard and recording 5 minutes of video in each lesson starting from the process of opening the subject, the process of delivering the subject and finally, the closing in the learning process.

The learning process in question is that formative tests must be carried out in the second week and in the sixth week, the scores are stored as evidence that the learning process has been carried out and formative tests as a form of assessment see the extent to which students or learners master the material given by educators or teachers in the final data collection carried out is self-assessment, namely where the birds fill out a questionnaire as a form of reflection on mastery of the method used, namely problem-based learning.

Data analysis in the scientific method of educational supervision can certainly use statistical analysis as well as qualitative analysis in this case in the supervision process studied by the researcher, namely using qualitative analysis where the observation analysis used in the supervision process on thirty observation items the average score obtained is decreasing where there are still many who are less active in the problem identification phase. Next in the analysis there are indeed several things that are found where educators when delivering lesson material must have thorough preparation so that in the discussion process the delivery of material is more directed because there are several students who still do not really understand the material given. Of course, these are some friends who are important notes from the supervision process for data analysis, triangulation needs to be carried out where looking at the facts in the field then the methods used and the data obtained in this case there is a diagnosis that the strength is that teachers or educators must be able to manage time in the learning process then the ability to use media and the weakness is as stated is the

lack of facilitating student participation in the exploration phase of course these are also some notes in the supervision process sometimes there are those that show an increase and sometimes there are also those that show a decrease based on the supervision carried out.

Feedback or feedback of course in the scientific method of educational supervision can be used written reports this is in accordance with observations made by researchers in the field where written reports are presented in graphic form for example the increase in value as done in the Quranic Literacy Elementary School written reports can be seen from the graph of the increase in value of course in the form of a table as a data breakdown then make a diagram not only the graph of the increase in value also observation tables and several video excerpts there is also a reflective dialogue of as much as or a period of thirty minutes carried out by educators or teachers highlighting the success of the use of digital media but still suggesting the existence of thinking techniques to increase participation of students in the learning process this feedback is also a form of measure of how the success of learning objectives carried out by educators to students is related.

Implementation and monitoring of course in the supervision process that we observed carried out by the supervisor in this case the internal supervisor, namely the Principal where the principal certainly carries out strategies to improve student learning outcomes and improve teacher performance, including discipline where every teacher or educator during the learning process must arrive on time, learning must be carried out according to plan, the learning process must not be carried out not according to plan because it will affect the learning objectives or targets in the learning process must be carried out dynamically, not statically, one of the methods used is the problem based learning method.

Where every learning process aims to solve several kinds of problems, including Islamic religious education material, of course there are many problems faced in this material, an educator must be able to provide solutions to students and this can be realized in the test or evaluation process, as usual, teachers carry out evaluations such as formative tests to see and assess the extent to which students' abilities are achieved in understanding the material given by the educator.

DISCUSSION

Scientific-Method Educational Supervision as a Continuous Improvement Process

The findings indicate that educational supervision at SD Literasi Qur'ani in Rejang Lebong has the potential to function as a systematic mechanism for improving instructional practice when supervision is conducted through a structured, evidence-based process. However, the implementation observed in the field was not yet fully consistent or continuous. The supervision process involved planning, classroom observation, documentation, formative assessment, teacher self-assessment, data analysis, feedback, and follow-up. This finding suggests that scientific-method supervision should not be understood simply as an activity of monitoring teachers, but rather as a cyclical professional learning process in which evidence from classroom practice is used to identify instructional problems, formulate improvement strategies, and evaluate subsequent changes.

This interpretation is consistent with the broader development of educational supervision from an administrative and control-oriented activity toward a developmental approach that emphasizes teacher learning and instructional improvement. Previous research has similarly argued that effective supervision should provide teachers with professional support, constructive feedback, and opportunities for reflection rather than merely evaluate compliance with administrative requirements. A systematic review of educational supervision across different national contexts also found that clinical, collaborative, mentoring, and self-directed approaches can contribute to teacher professional development and improvement of teaching and learning, although implementation is often constrained by limited resources and insufficiently experienced supervisors (Regassa & Mamo, 2024). In the Indonesian context, supervision also continues to face the challenge of being interpreted predominantly as an administrative activity rather than as a mechanism for sustained teacher professional development (Hilhamsyah et al., 2025).

The present findings provide a more concrete illustration of this issue. Although the school had undertaken supervision activities, the process was not always supported by systematic problem identification and continuous follow-up. The observation data showed that some teachers still experienced difficulties during the problem-identification and exploration phases of problem-based learning. Consequently, the supervision process became important not simply for judging whether teachers had followed a lesson plan, but for identifying specific instructional practices that required improvement. This evidence supports the view that supervision becomes more meaningful when observation results are translated into specific professional feedback and subsequent action.

Evidence-Based Observation and Teacher Professional Practice

One important finding concerns the role of classroom observation and documentation in making supervision more objective. The supervisor conducted repeated classroom visits and documented classroom activities through observation instruments, photographs, and short video recordings. These procedures

provided evidence about teacher preparation, teacher–student interaction, use of instructional media, classroom management, and student participation. The use of multiple sources of evidence is particularly relevant to qualitative case study research because triangulation can strengthen the credibility of interpretations and reduce reliance on a single perspective (Lincoln & Guba, 1985; Yin, 2018).

The findings also demonstrate that the value of observation lies not merely in collecting data but in using the data to generate actionable feedback. The teachers' use of laptops and projectors, classroom discussions, question-and-answer activities, and problem-based learning demonstrated several positive instructional practices. Nevertheless, the observation also identified limitations, particularly the uneven participation of students during the problem-identification and exploration stages. Thus, scientific supervision helped reveal a distinction between implementing an instructional model and implementing it effectively. A teacher may formally employ problem-based learning, but the effectiveness of the approach depends on the extent to which students are actively engaged in identifying problems, discussing possible solutions, and constructing understanding.

This finding is supported by research on instructional coaching. A meta-analysis of 60 causal studies found that teacher coaching had a substantial positive effect on instructional practice and a smaller but positive effect on student achievement (Kraft et al., 2018). More specifically, Glover et al. (2023) found that coaching activities involving opportunities for teacher practice and feedback were associated with stronger implementation of evidence-based classroom strategies and, in some contexts, improved student achievement. These findings help explain why the supervisory activities observed in the present study may contribute to teacher improvement: the important element is not classroom observation alone, but the combination of observation, evidence, feedback, reflection, and opportunities for teachers to modify their practice.

Problem-Based Learning and Student Engagement

Another important finding is the use of problem-based learning (PBL) in Islamic Religious Education. Classroom observations indicated that PBL encouraged discussion, questioning, and greater student involvement in the learning process. However, the findings also revealed that student participation was not uniformly strong, particularly during the problem-identification and exploration stages. This indicates that the effectiveness of PBL depends considerably on teacher preparation and facilitation.

Recent evidence provides support for the potential contribution of PBL to learning outcomes. A second-order meta-analysis synthesizing 36 datasets from 22 previous meta-analyses reported a positive overall effect of PBL on cognitive and affective learning outcomes, with a mean effect size of $g = 0.726$ (Koçoğlu & Kanadlı, 2025). Similarly, research synthesizing studies of K–12 students has shown that PBL can positively influence cognitive outcomes, including academic achievement and problem-solving-related skills (Erdem, 2024). These findings are broadly consistent with the present case, where students participated in discussion and question-and-answer activities and demonstrated satisfactory performance in formative assessments.

Nevertheless, the present findings suggest that PBL should not be treated as automatically effective merely because it is included in the lesson plan. The supervision data showed that several students still had difficulty understanding the learning material and participating actively in the exploration stage. This suggests that teachers require adequate preparation in designing meaningful problems, scaffolding discussion, managing time, and ensuring that all students have opportunities to participate. Therefore, supervision should examine not only whether PBL is used but also the quality of its implementation.

Formative Assessment as Evidence of Learning Progress

The use of formative tests in the second and sixth weeks represents another important component of the scientific supervision process. These assessments provided evidence of students' understanding and allowed the supervisor and teacher to examine whether the learning process was producing the intended outcomes. The manuscript reports that students were generally able to achieve good scores in formative assessment, although the observation findings also indicated that some students still experienced difficulties during classroom activities. This suggests that student achievement cannot be interpreted exclusively from test scores; it should be considered together with classroom participation, interaction, task performance, and other evidence of learning.

This interpretation is supported by recent meta-analytic evidence. Yao et al. (2024), synthesizing 258 effect sizes from 118 K–12 studies, found that formative assessment had a positive overall effect on academic achievement, with an overall Hedges' g of 0.25. Xuan et al. (2022), based on 48 studies involving more than 116,000 K–12 students, similarly reported a positive, although modest, effect of formative assessment on reading achievement. These findings suggest that formative assessment is most valuable when it is integrated into the instructional process rather than used merely as an end-of-unit test.

In the present study, formative assessment was complemented by teacher self-assessment and classroom observation. This combination is important because it allows learning outcomes and teaching practices to be

considered simultaneously. The teacher's self-assessment can provide insight into how educators perceive the implementation of PBL, while observation provides an external perspective. The combination of these sources strengthens the possibility of reflective professional learning. However, because the present study is qualitative and does not report statistical pre-test/post-test comparisons, the findings should not be interpreted as evidence of a statistically demonstrated causal effect of scientific supervision on student achievement. Rather, the findings demonstrate a plausible process through which systematic supervision can support instructional improvement.

Feedback, Reflection, and Follow-Up as the Core of Supervision

The findings further demonstrate that feedback and reflective dialogue are central to the effectiveness of scientific-method supervision. After classroom observations, feedback was provided through written reports, observation tables, graphical representations, and reflective dialogue. The feedback recognized the successful use of digital media while also identifying the need to increase student participation and strengthen thinking activities.

This finding is important because supervision has limited value if observation ends with documentation. The real professional value emerges when evidence is transformed into a dialogue about what happened, why it happened, and what should be changed in subsequent lessons. In this sense, supervision can function as a form of instructional coaching. Kraft et al. (2018) showed that coaching can improve teachers' instructional practices, while Glover et al. (2023) demonstrated the importance of practice and feedback opportunities in supporting teachers' use of evidence-based instructional strategies.

The findings therefore suggest that the principal and external supervisors should adopt a developmental rather than punitive orientation. Feedback should focus on specific classroom evidence, identify strengths before weaknesses, and formulate realistic improvement targets. This is particularly important in the context of Islamic Religious Education, where the instructional objective extends beyond cognitive achievement to include values, attitudes, and character development. The manuscript itself emphasizes honesty, tolerance, responsibility, cooperation, and other affective dimensions as important learning outcomes. Consequently, supervision should also examine whether instructional practices provide opportunities for students to demonstrate these values through authentic classroom activities.

The Role of School Leadership and the Sustainability of Supervision

The study indicates that school principals have an important role in sustaining supervision. In the observed setting, the principal acted as an internal supervisor and was responsible for monitoring teacher discipline, lesson implementation, and instructional processes. This finding is consistent with recent literature emphasizing the role of school leadership in transforming supervision from episodic evaluation into continuous professional development.

The sustainability issue is particularly important because the manuscript identifies infrequent supervision as one of the major problems in the research setting. If supervision is conducted only occasionally, the resulting evidence may identify problems but may not provide sufficient opportunities to determine whether teachers have successfully addressed them. Continuous supervision, therefore, should involve repeated cycles of planning, observation, feedback, implementation, and re-observation. Such a cycle is consistent with the principles of reflective and evidence-based professional learning.

The Indonesian educational context makes this issue especially relevant. Recent Indonesian literature suggests that educational supervision can be strengthened through principal involvement, collaborative approaches, and technology-supported supervision, particularly when supervision is directed toward teacher professionalism rather than administrative compliance (Hilhamsyah et al., 2025). Thus, the findings of the present study contribute to the discussion by showing how a scientific supervision framework can be operationalized at the school level through concrete evidence such as lesson plans, classroom observations, formative assessments, documentation, and teacher reflection.

Theoretical and Practical Implications

Theoretically, this study reinforces the idea that educational supervision is most productive when it operates as a cyclical process of evidence generation, interpretation, feedback, and instructional improvement. The scientific method provides a useful structure because it encourages supervisors and teachers to move from identifying problems to collecting evidence and evaluating improvement. However, the findings also demonstrate that scientific supervision should not become excessively technical or bureaucratic. Quantitative evidence such as test scores and observation ratings needs to be combined with qualitative information about classroom interaction, student engagement, teacher reflection, and contextual factors.

Practically, the study suggests several priorities for schools. First, supervision should be scheduled regularly rather than conducted only when problems arise. Second, observation instruments should focus on observable instructional practices and student learning behaviors. Third, formative assessment results should be integrated with classroom observation and teacher reflection. Fourth, feedback should lead to specific and achievable improvement plans. Fifth, principals and external supervisors should coordinate their roles so that

supervision is continuous rather than fragmented. Finally, digital documentation, including photographs and short classroom videos, can be used as evidence for reflective discussion, provided that ethical requirements concerning informed consent, confidentiality, and responsible data management are maintained.

Overall, the findings indicate that scientific-method educational supervision can provide a useful framework for improving instructional quality and supporting teacher professional development. However, the evidence from this case should be interpreted cautiously. The study does not establish a causal relationship between supervision and improved student achievement because it uses a qualitative case-study design and does not report statistical effect estimates. Its main contribution is instead to illuminate the processes through which supervision can identify instructional weaknesses, support teacher reflection, and encourage improvements in classroom practice. Future studies could build on these findings through multiple-case designs, longitudinal observations, mixed-method approaches, or quasi-experimental studies that examine changes in teacher performance and student achievement over a longer period.

CONCLUSION

The implementation of educational supervision using scientific methods at the elementary school level in Rejang Lebong Regency has not been carried out well. Educational supervision is still rarely carried out, so it has an impact on the learning process with the achievement of learning objectives that are not optimal from the supervision process carried out starting from the planning stage, namely in the preparation of learning implementation plans or teaching modules, there are still several teachers who do it so that when the learning process takes place, it sometimes does not match the expected goals because the learning implementation plan is not prepared well in accordance with the provisions of the applicable curriculum. The next stage in the learning planning process is the analysis of needs and context, educators should create student provinces starting from the age of the level of literacy skills and even the special needs of students so that they can be observed properly. How the development of students in the school environment must also be ready to provide good cultural facilities, discipline, and parental support. The curriculum implemented must be able to map or meet competency standards or basic competencies with the independent curriculum and Islamic character values to be achieved such as tolerance, honesty, and hard work. The design of objectives and indicators has not been carried out optimally. Supervision is still not able to design the objectives and indicators such as making objectives based on blooms taxonomy and affective domain or character that will be achieved by students then in the achievement or completion of achievement indicators is also not optimal and still confused in the selection of methods and media such as the selection of active methods if he is in Islamic religious education active method namely Alquran project then must prepare visual media such as posters then the presence of audio and the provision of Alquran applications when the learning process must also be carried out the right approach such as in Islamic religious education subjects the Islamic character approach carried out starting from moral values practical activities cooperative learning models to the use of the Alquran and hadith provide examples. The evaluation process of educators should not only be based on the results of formative and somatic tests but must also see and record the development of students' abilities, therefore it is very important to observe the affective aspects of students starting from their emotional stages to the formation of their character so that recommendations from researchers are very important to carry out educational supervision in scientific methods on an ongoing basis and must be intensive, both external supervisors from the education office and internal ones, namely the role of the principal

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