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By Universitas Muhammadiyah Sidoarjo

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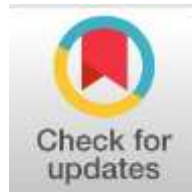
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Principal Academic Supervision Facilitates Deep Learning In Inclusive Elementary Classrooms: Supervisi Akademik Kepala Sekolah Memfasilitasi Pembelajaran Mendalam Di Sekolah Dasar Inklusif

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Abstract

General Background The shift toward twenty-first-century competencies requires educators to facilitate meaningful, mindful, and joyful educational experiences. **Specific Background** Implementing these pedagogical strategies presents complex challenges in integrated environments where educators must accommodate diverse cognitive profiles and special educational needs. **KnowledgeGap** Current professional development often prioritizes administrative document reviews over the continuous, collaborative coaching required to help educators design authentic, student-centered classroom activities. **Aims** This research investigates how structured leadership interventions facilitate the pedagogical transition toward rigorous conceptual instruction in an integrated primary school setting. **Results** Through two collaborative action cycles, educators' pedagogical comprehension progressed from a 51% baseline to 83%. Correspondingly, student conceptual mastery and engagement metrics grew from 44% to 79%, reflecting positive shifts in inclusive classroom management and differentiated instruction. **Novelty** This study uniquely links cyclical, reflective leadership mentoring directly with both educator competency metrics and the cognitive advancement of special needs learners. **Implications** Deploying systematic, non-evaluative observation and feedback frameworks provides school leaders with a proven mechanism to transform teaching quality and cultivate highly adaptive, learner-centric environments.

Highlights

- ♦ Structured leadership mentoring progressed teacher pedagogical comprehension from a 51% baseline to 83% across two cycles.
- ♦ Learner conceptual mastery and classroom engagement metrics grew significantly from 44% to 79%.
- ♦ Continuous reflective dialogue successfully transitioned teachers toward utilizing differentiated instructional strategies and varied learning media.

Keywords

Academic Supervision; Deep Learning; Inclusive Education; Teacher Competence; Action Research

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INTRODUCTION

Enhancing the quality of education remains one of the strategic priorities in Indonesia's human resource development agenda. The reform of education has shifted from merely providing access to an increasing emphasis on improving the quality of teaching and learning to produce learners with twenty-first century competencies. In line with the national education policies, classroom teaching should go beyond content transmission to develop students' conceptual understanding, critical thinking, problem solving, collaboration, communication and application of knowledge in authentic contexts. This educational orientation is usually referred to as deep learning. Deep learning is a way of learning that places the students in the role of active constructors of knowledge through meaningful, reflective and contextual learning experiences. According to Biggs and Tang (2011), deep learning involves learners in constructing a thorough conceptual understanding by linking new knowledge to past experiences instead of memorizing. This approach is expected to promote higher-order thinking skills and lifelong learning by helping students to analyze, evaluate and apply knowledge in different situations. Deep learning has thus become one of the most pertinent pedagogical approaches for confronting the challenges of twenty-first century education.

The implementation of deep learning in education in Indonesia is increasingly important, especially after the transformation of education that prioritizes the development of competencies and characters, as well as the fulfillment of Profil Pelajar Pancasila. These reforms call for teachers to establish learning environments that actively involve students, foster inquiry and reflection, and offer students opportunities to construct knowledge independently. So, teachers are expected to not only deliver the instructional content but create the meaningful learning experiences to support the students' cognitive, social and emotional development. This makes the implementation of deep learning in inclusive schools a lot more difficult. Inclusive education is about providing equal educational opportunities for all students, including those with special educational needs, in the same learning environment. Hallahan, Kauffman, and Pullen (2022) describe inclusive education as the accommodation of learner diversity in terms of characteristics, abilities, needs, and learning profiles within schools. Therefore, teachers require both subject-matter knowledge and pedagogical skills to create adaptive, flexible and responsive learning experiences that cater to the needs of individual students.

Teachers play a vital role in the successful implementation of deep learning in inclusive classrooms. Teachers are professional educators who have the task of educating, teaching, guiding, directing, training, assessing and evaluating students. This is based on Law Number 14 of 2005 concerning Teachers and Lecturers in Indonesia. Teacher professionalism is reflected in four necessary competencies: pedagogical, professional, social, and personal competencies. Pedagogical competence is especially important in this regard as it involves teachers' abilities to understand the characteristics of learners, to design effective instructions, to implement meaningful learning activities and to conduct continuous assessment. These competencies are essential for developing deep learning in inclusive learning environments. While its importance is well-recognized, previous studies show that the implementation of deep learning in schools has been challenging. Many teachers still see deep learning as using active learning techniques without a full understanding of its focus on higher-order thinking, reflective learning and student-centered teaching. As a result, classroom practices are often teacher-centered, with learning activities dominated by one-way transmission of knowledge, which restricts students' active engagement and conceptual understanding.

In inclusive schools these challenges are considerably more complex. Teachers should design learning objectives based on the various characteristics of learners, use differentiated instructional strategies, use diagnostic assessments, and adapt learning experiences to meet individual students' needs. Tomlinson (2017) stated that differentiated instruction is a way in which teachers adapt the content of instruction, learning processes, products, and learning environments according to students' readiness level, interests, and learning profile. This differentiation is a crucial part of implementing deep learning in inclusive classrooms. Yet classroom realities suggest that many teachers still have only a limited understanding of the conceptual bases of deep learning and practical strategies for its implementation. Teachers often find it difficult to design lesson modules that incorporate deep learning principles, to design meaningful learning activities, to select authentic assessment methods and to address the needs of students with diverse learning needs. Consequently, the quality of instruction is often not well aligned with the optimal academic and personal development of students. Thus, there is a need for continuous professional development to improve teachers' professional competence. One of the most strategic ways is academic supervision by the school principals. Glickman, Gordon, and Ross-Gordon (2018) state that academic supervision is a systematic process that uses coaching, mentoring, classroom observation, reflective dialogue, and constructive feedback to enhance the quality of instruction. Academic supervision is not an evaluation tool to find the weaknesses of teachers but it is a tool to help the teachers to grow professionally and become more effective in their teaching.

Similarly, Sergiovanni and Starratt (2014) describe academic supervision as a collaborative effort between principals and teachers that promotes continuous professional development and instructional improvement. In this context, principals are instructional leaders who support teachers' professional learning in reflective practices and evidence-based instructional improvement. Hallinger (2011) further argues that instructional leadership demands principals to build teachers' professional capacity through systematic supervision, classroom monitoring, constructive feedback, and the development of a school culture that fosters continuous learning and improves educational quality. Therefore, the success of deep learning relies not only on the teachers' expertise but also on the effective instructional leadership of the school principals. Academic supervision is even more important in inclusive schools, as teachers have to deal with students with very different characteristics and learning needs. Effective supervision should not only focus on administrative compliance, but also on teachers' capacity to enact inclusive, differentiated and deep-learning-oriented instructional practices. Systematic supervision and reflective evaluation give teachers the opportunity to discuss instructional challenges, receive professional feedback, and continuously improve their classroom practices. The research uses a School Action Research (SAR) design

that allows principals to carry out practical interventions to enhance teachers' knowledge of deep learning through successive cycles of planning, action, observation, and reflection. This cyclical approach allows interventions to be evaluated and refined based on evidence collected at each cycle of research, facilitating continuous improvement.

Initial observations in an inclusive elementary school showed that teachers had a wide range of understanding of deep learning. Some of the teachers exhibited limited understanding of its basic features, had difficulties in integrating differentiated instruction in lesson planning and also experienced difficulties in designing authentic assessment that could measure students' conceptual understanding and higher order thinking skills. Furthermore, the study found that present academic supervision activities tend to focus on the review of instructional documents and ignore professional coaching aimed at improving classroom instructional practices. The results indicate that academic supervision should be strengthened as a way to develop teachers professionally. The academic supervision is a systematic, collaborative and continuous process which is designed to help teachers to develop a deeper understanding of the deep learning principles and become more capable to plan, implement and evaluate meaningful, inclusive and student-centered learning experiences which accommodate the diverse needs of all learners. In view of these points, this study aims to explore the effectiveness of principals' academic supervision on teachers' understanding of deep learning in an inclusive elementary school. It is expected that the results will contribute to the strengthening of the teachers' professional competence, to the improvement of the quality of academic supervision and to the support of the implementation of meaningful and inclusive learning practices.

METHOD

This study uses School Action Research (SAR) with the model of Kemmis and McTaggart, which has 4 stages that are cyclical, they are planning, action, observation, and reflection. The reasons for choosing School Action Research is because it allows the school principal to do systematic and reflective interventions in order to improve the professional competence of teachers through continuous cycles of improvement. The intervention of this study is academic supervision of the school principal to improve understanding and implementation of deep learning in an inclusive elementary school. The research was conducted in SD Negeri 008 Kombeng, an inclusive elementary school to accommodate students with special educational needs. The research was conducted in the second semester of the academic year 2025/2026. The participant was a classroom teacher at the Grade IIIA level. The participant taught in an inclusive classroom setting. The teacher was chosen due to initial observations showing a lack of understanding of deep learning principles, differentiated instruction and authentic assessment practices necessary for meaningful learning in inclusive education. The intervention was performed through two action research cycles. In each cycle, there was planning the academic supervision program, observation of the classroom, constructive feedback, reflective discussions and follow-up improvements. During the supervision process, the principal guided the teacher to understand the concepts and characteristics of deep learning, integrate meaningful, mindful, and joyful learning into lesson planning, use differentiated instruction, and design authentic assessment strategies suitable for inclusive classrooms.

Data were gathered through classroom observation, semi-structured interviews and documentation. Evaluation of Academic Supervision Implementation was using observation sheets and the teacher's understanding and application of the principles of deep learning. Interviews were conducted to explore teacher perceptions, experiences and challenges of implementing deep learning before and after academic supervision. Documentation included lesson plans, supervision records, field notes, photographs, and other relevant instructional documents that corroborated the research findings. Technique triangulation was used to enhance the validity of the findings by comparing data gathered from observations, interviews and documentation. Data analysis was conducted through quantitative and qualitative descriptive methods. The data of quantitative results of observation instruments were converted into percentage to find out teachers' level of understanding in research cycle categorized into Very Good (86-100%), Good (76-85%), Fair (60-75%), and Poor (<60%) . Qualitative data obtained through observation, interview, document review, and field notes were analyzed using an interactive model proposed by Miles, Huberman, and Saldaña (2014) which consists of data condensation, data display, and conclusion drawing and verification. The results were considered successful if the teacher's understanding of deep learning was at least in the Good category ($\geq 76\%$) and showed continuous improvement in the following action cycles.

RESULT AND DISCUSSION

Research Setting

The research was conducted at SD Negeri 008 Kombeng, Kombeng District, East Kutai Regency, East Kalimantan Province, Indonesia. This school is a public elementary school that provides inclusive education services for regular students and students with special educational needs. The school had 343 students in the academic year 2026/2027. There were qualified teaching and administrative personnel to provide instructional and educational services. SD Negeri 008 Kombeng is an inclusive school which tries to provide equal learning opportunities by creating a safe, supportive and student-centered learning environment that can serve the diverse characteristics and learning needs of learners.

The school's commitment to improving the quality of education is evidenced by its continuous efforts to improve teachers' professional skills through various professional development programs. Before the study, initial observations indicated that the teachers had different levels of understanding about deep learning and its implementation in inclusive classrooms. Teacher-centred and content-driven instructional practices still prevailed, restricting opportunities for students, especially those with special educational needs, to gain active participation in meaningful learning activities. In addition, instructional strategies were not fully differentiated to address the diverse learning profiles of students, limiting opportunities for

learners to develop critical thinking, conceptual understanding, and meaningful connections between classroom learning and real-life experiences.

To solve these problems, the school decided to use academic supervision as a professional development program led by the principal. The supervision process consisted of classroom observations, constructive feedback, reflective discussions and follow-up coaching to improve teachers' pedagogical competence in implementing deep learning. The hope was that, through this systematic process of supervision, teachers would increase their understanding of meaningful, mindful, and joyful learning and, therefore, design and facilitate more effective and inclusive classroom instruction. The characteristics and challenges were considered to be appropriate for the School Action Research to be conducted at SD Negeri 008 Kombeng to improve the teachers' understanding of deep learning through the principals' academic supervision in an inclusive elementary school.

Initial Condition (Pre-Action)

Before the intervention, a preliminary observation was done to determine the teacher's level of understanding of deep learning in the context of inclusive classroom instruction. The results indicate that the teacher's perception of deep learning had not yet reached the desired level. The teacher was familiar with the term, but still there was limited understanding of its underlying concepts, principles, characteristics and practical implementation in classroom teaching. Instruction was still largely content driven with little emphasis on helping the students develop their conceptual understanding, critical thinking, reflective learning and meaningful engagement in the learning process .

Furthermore, the teacher did not consistently embed the core principles of meaningful learning, mindful learning, and joyful learning in lesson planning and classroom practice. Learning activities tended to highlight the completion of curriculum content rather than providing authentic learning experiences that encouraged students to actively construct knowledge, connect new concepts with previous experiences and collaborate in solving contextual problems. Differentiated instructional strategies and authentic assessment practices appropriate for inclusive classrooms were also not yet efficiently implemented.

The main participant in the study was a Grade IIIA classroom teacher. The study was focused on the improvement of the teacher's understanding of deep learning through the principal's academic supervision, although two students with special educational needs (EY and RP), as part of the inclusive classroom context, participated. Their role was to provide authentic learning conditions to observe how the teacher implemented deep learning principles and differentiated instructional practices in classroom instruction. Therefore, students were not considered participants of the research, but as a part of the educational setting where the intervention was taking place.

Cycle I

In the planning stage, the researcher and the principal prepared the activities together for the intervention implementation. The activities included: developing the academic supervision schedule, preparing the academic supervision instruments, classroom observation sheets, teacher deep learning understanding observation sheets, interview guidelines, and documentation forms. A preliminary interview was also conducted with the participating teacher to determine the teacher's understanding of deep learning, current instructional practices, and challenges encountered in implementing inclusive classroom instruction. The results of this needs assessment led to the design of an academic supervision program to enhance the teacher's understanding and implementation of deep learning. The intervention in Cycle I was carried out through the academic supervision of the school principal. The process began with pre conference that the principal and the teacher discussed the lesson plan, learning objectives, instructional strategy, learning media and assessment methods prepared for the lesson. Then the principal observed the classroom teaching to find out how much the teacher understands and applies the principles of deep learning in the teaching learning process. Following the classroom observation, there was a post-conference in the form of reflective discussion. During this session, the principal gave constructive feedback, pointing out the teacher's strengths as well as areas that need improvement. The focus was on designing meaningful learning activities, developing higher order questioning techniques, increasing student participation and including reflective learning activities at the end of instruction.

The academic supervision process was observed throughout its implementation. The observations included three main aspects, including the quality of academic supervision, the teacher's understanding of deep learning, and the quality of classroom instruction. The data were gathered through structured observation sheets that measured the supervision practices of the principal, the teacher's understanding of deep learning, and classroom instructional performance. The data collected was then used to assess the effectiveness of the intervention and to identify areas that required further improvement. Observation revealed that the principal achieved well in most of the steps of the academic supervision process. However, follow-up coaching and on-going mentoring had not been fully optimized yet. The total implementation of academic supervision scored an average of 69% (Fair). This implies that the process of supervision had been followed as planned but there was need for more support to enhance the professional development of teachers. Again, the teacher's grasp of deep learning received an average score of 64% (Fair), signalling an emerging understanding of the concept, but inconsistent implementation in classroom practice. In addition, the quality of instruction in the classroom improved with an average score of 69% (Fair) for the dimensions of meaningful learning, mindful learning, joyful learning and differentiated instruction.

Table 1. Results of the Principal's Academic Supervision in Cycle I

Aspect of Academic Supervision	Score (%)	Category
Supervision Planning	70	Fair
Supervision Implementation	68	Fair

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Constructive Feedback	69	Fair
Follow-up Activities	69	Fair
Average	69	Fair

The results in table 1 show that the implementation of the principal's academic supervision in cycle I obtained an average score of 69% which is in the Fair category. Most of the supervision activities were implemented as planned like pre-observation conference, classroom observation and post-observation feedback. However, the follow-up stage has not been implemented optimally. As such, further mentoring was still required to support the teacher in consistently embedding deep learning principles in the inclusive classroom.

Table 2. *Teacher's Understanding of Deep Learning in Cycle I*

Indicator	Score (%)	Category
Understanding the Concept of Deep Learning	65	Fair
Designing Meaningful Learning	63	Fair
Implementing Deep Learning Strategies	64	Fair
Conducting Learning Reflection	64	Fair
Average	64	Fair

Table 2 shows that the average score of the teacher's understanding of deep learning is 64% which is in the Fair level of understanding. The teacher was beginning to understand the big ideas of deep learning but the use of purposeful learning, student-focused teaching, and reflective learning practices were not consistent. The results suggest a need for greater professional support to improve both conceptual knowledge and classroom practice.

Table 3. *Teacher's Instructional Quality in Cycle I*

Dimension	Score (%)	Category
Meaningful Learning	68	Fair
Mindful Learning	69	Fair
Joyful Learning	70	Fair
Differentiated Instruction	69	Fair
Average	69	Fair

Table 3 shows that the results of the classroom observations indicated that the teacher's instructional quality improved during Cycle I by an average of 69% (Fair). The teacher started to use more varied instructional media, encouraged more student participation, and tried to relate lesson content to students' prior experiences. Opportunities for higher order thinking, systematic reflection and differentiated instructional practices were, however, still limited and had not yet been consistently integrated throughout the learning process.

The analysis of data from classroom observations, interviews, documentation and field notes formed the reflection phase. In conclusion, the findings revealed that the principal's academic supervision had a positive impact on the teacher's comprehension of deep learning. The teacher learned new strategies around student-centered instruction, the importance of meaningful questioning, and opportunities for students to not only participate, but reflect on their learning. However, the teacher still faced problems in planning the learning activities to develop higher order thinking skills, in the implementation of differentiated instruction consistently, and in conducting reflective learning activities at the end of the lessons. As the set success criteria had not yet been met several improvements were planned in Cycle II. They included the need to provide more intensive academic supervision, offer model lesson plans based on deep learning principles, assist the teacher in developing higher-order thinking questions, strengthen differentiated instructional practices, and improve the implementation of reflective learning activities to ensure that deep learning principles were infused consistently in inclusive classroom instruction.

Cycle II

Cycle II activities were developed on the basis of the reflection findings of Cycle I. The academic supervision program was revised by the researcher and the principal through the reinforcement of supervision instruments, the improvement of mentoring strategies, and the preparation of examples of lesson plans based on the principles of deep learning. There was more emphasis on helping the teacher to integrate meaningful learning, mindful learning and joyful learning into classroom instruction while implementing differentiated instructional strategies appropriate for an inclusive classroom. The principal also planned for more intensive classroom coaching and reflective conversations to address the instructional deficiencies identified in the last cycle. The intervention in Cycle II was a more intensive implementation of academic supervision. The beginning of the process was a pre-observation conference in which the principal and the teacher reviewed the results of the reflection from Cycle I and discussed strategies for improving the classroom instruction. The teacher was guided on how to design lesson objectives aligned with deep learning, select appropriate instructional strategies, utilize more diverse learning media, formulate higher-order thinking questions, and implement structured learning reflection at the end of each lesson.

The principal did conduct direct classroom observations using the revised academic supervision instrument after the planning session. After the lesson, a post-conference was conducted to provide constructive feedback, discuss instructional strengths and weaknesses, and develop follow-up actions for continuous improvement. During the cycle, the teacher was

individually mentored to ensure consistent application of the principles of deep learning in the inclusive classroom setting. In Cycle II, observations were made to measure the improvement of the implementation of academic supervision, the quality of learning in the classroom, and the application of deep learning principles by the teacher after the improvement of the mentoring process.

Table 4. Academic Supervision Outcomes in Cycle II

Observed Aspect	Percentage (%)
Use of varied instructional strategies	85
Use of instructional media	83
Student engagement in learning	80
Inclusive classroom management	84
Average	83

The results of the implementation of academic supervision and classroom instruction as a whole with an average of 83% or Good can be seen in Table 4. Compared to Cycle I (69%) there was a substantial improvement in all aspects of instruction. The teacher showed more ability in the application of different teaching methods, selection of suitable learning resources, management of the inclusive classroom and engagement of students, especially those with special educational needs, in the learning activities. These improvements indicated the positive effect of the continuous academic supervision by the principal.

Table 5. Teacher's Instructional Quality in Cycle II

Observed Aspect	Percentage (%)
Use of varied instructional strategies	85
Use of instructional media	83
Student engagement in learning	80
Inclusive classroom management	84
Average	83

As shown in Table 5, the quality of classroom instruction improved significantly in Cycle II, with an overall average of 83% (Good). The teacher succeeded in implementing the more variation of the instruction, using the learning media better, motivating students to be more active, and creating a more inclusive learning environment. Observations in the classroom showed that students were more involved in learning activities, more active in discussions, and more self-assured in answering questions in the classroom.

Table 6. Students' Deep Learning Outcomes in Cycle II

Indicator	Percentage (%)
Understanding learning concepts	80
Connecting concepts with prior experiences	78
Explaining concepts using their own words	77
Applying knowledge in simple situations	82
Average	79

Table 6 The results show that the deep learning outcomes of students had improved significantly in Cycle II with an average score of 79% which is in the Good category. Students demonstrated a better conceptual understanding, successfully linked newly acquired knowledge with their previous experience, explained concepts in their own language and applied learned knowledge in solving classroom tasks. These improvements, as compared to Cycle I, indicate that the improvement of instructional practices had positively contributed to meaningful learning experiences for students with special educational needs. The interview results also supported the observation data. One teacher participant stated that the principal's academic supervision had a great effect on professional competence in planning and implementing deep learning. The teacher explained that lesson plans were developed through constructive feedback and ongoing mentoring, appropriate instructional strategies were identified and differentiated learning activities were implemented for students with special educational needs. Furthermore, the teacher observed that students were more active in classroom activities, more confident in answering questions, and had a greater understanding of instructional materials. The teacher also emphasized that the use of various instructional media could increase students' learning motivation and classroom participation.

The documentation gathered during Cycle II supported the findings from observations and interviews. Photographs, classroom observation records, supervision records, lesson planning and field notes showed clear improvements in the implementation of academic supervision and classroom instruction. Documentation showed that the principal regularly observed classrooms, led reflective discussions, conducted constructive feedback sessions, and provided follow-up coaching. Similarly, teachers' lesson plans revealed a greater integration of deep learning principles, and photographs of the classrooms revealed more active student participation, collaborative learning, and effective use of instructional media in the inclusive classroom.

The reflection performed at the end of the Cycle II demonstrated the success of the intervention to achieve the proposed objectives. The teacher demonstrated considerable progress in the application of deep learning by using different teaching

strategies, using instructional media well, managing the inclusive classroom more efficiently, and providing meaningful student-centered learning experiences. The teacher had the opportunity to systematically improve instructional practices through observation, constructive feedback, reflection, and follow-up coaching through ongoing academic supervision. The results of the study generally show that the academic supervision of the principal was successful in improving the quality of instruction and the application of deep learning in the inclusive classroom. The quality of the teacher's instruction increased from 69% to 83% in Cycle II, and the students' deep learning outcomes increased from 64% to 79%, above the success criteria set. At the end of Cycle II the intervention was stopped, because all research indicators had been reached.

Table 7. Summary of Research Findings

Aspect	Pre-Action	Cycle I	Cycle II
Students' Deep Learning Outcomes	44%	64%	79%
Teacher's Instructional Quality	51%	69%	83%

Table 7 summarizes the continuous improvement for all the observed variables throughout the study. The results of deep learning for students increased by 35% from 44% in the pre-action stage to 79% in Cycle II. Similarly, the quality of the teacher's instruction improved by 32 percentage points from 51% to 83%. The findings of this study revealed that the principal's systematic academic supervision had greatly contributed to the improvement of teachers' instructional practices, which in turn improved the meaningful learning experiences and conceptual understanding of students in the inclusive classroom.

Table 8. Achievement of Research Success Indicators

Success Indicator	Target	Cycle II Result	Status
Students' deep learning outcomes	≥75%	79%	Achieved
Teacher's instructional quality	≥80%	83%	Achieved
Active student participation	Good	Good	Achieved

As can be observed from Table 8, the success indicators planned were achieved by the end of Cycle II. This result indicates that the principal's academic supervision was effective in enhancing the quality of the teacher's instruction and the utilization of deep learning in the inclusive classroom. Therefore, the School Action Research was stopped at the second cycle due to the successful achievement of all research objectives.

Discussions

The results of this study showed that the implementation of academic supervision by the principal was effective in increasing teachers' understanding of deep learning and improving the quality of instruction in an inclusive elementary school. The improvement took place gradually through the cycles of action research. The quality of teachers' instruction increased from 51% in the pre-action stage to 69% in Cycle I and increased again to 83% in Cycle II. Likewise, the students' deep learning results increased from 44% before the intervention to 64% and 79% in Cycle I and Cycle II respectively. The results show that systematic and continuous academic supervision improved teachers' pedagogical competence and created more meaningful learning experiences for students with special educational needs. The gradual improvement from Cycle I to Cycle II indicates that academic supervision is most effective when it is a continuous process of professional development and not a one-time assessment exercise. In the first cycle the principal stressed classroom observation, reflective discussion, constructive feedback, and follow-up planning which allowed the teacher to see the deficiencies in lesson planning and classroom delivery. The reflection findings led the second cycle to conduct more intensive mentoring, including guiding teachers to design lesson plans aligned with deep learning principles, apply differentiated instructional strategies, use appropriate learning media, and facilitate reflective classroom activities. This continuous cycle of observation, feedback and refinement allowed the teacher to gradually integrate meaningful learning, mindful learning and joyful learning into classroom practice, which led to improvement in instructional quality and student engagement.

The findings are consistent with the theoretical stance of Glickman, Gordon, and Ross-Gordon (2018), who suggest that academic supervision should be understood as a process of professional assistance to improve teachers' capacity to plan, implement, and evaluate teaching, rather than just as a mechanism to evaluate teacher performance. Similarly, Sergiovanni and Starratt (2013) suggest that effective supervision depends on cooperative relationships between principals and teachers, wherein reflective dialogue and constructive feedback encourage lasting instructional improvement. The collaborative supervision model used in this study is in accordance with these theoretical principles. The principal in this study was an evaluator and an instructional leader who continuously guided the teacher in improving classroom practice.

The improvement of teachers' instructional practices also directly contributed to students' development of deep learning. After improved instructional strategies were implemented, students were better able to understand concepts, relate new knowledge to prior experiences, explain concepts in their own words and apply acquired knowledge to simple learning tasks. The improvements imply that students are given more opportunities to develop meaningful understanding, rather than memorizing information, when instruction is of higher quality. Such improvements are particularly important in the context of inclusive education, since students with special educational needs often require structured guidance, differentiated learning experiences and meaningful classroom engagement to achieve optimal learning outcomes. The results are in agreement with Piaget's constructivist theory of learning which says that learners construct knowledge actively through interaction with their environment. Teachers are no longer only conveyors of knowledge but facilitators of learning experiences that promote exploration, discussion, reflection and problem solving. The findings also align with the concept of deep learning by Biggs and Tang (2011) that focuses on conceptual understanding, connecting prior and new knowledge, critical reflection and transferring knowledge to real-life situations. The positive changes in students' conceptual

understanding and participation indicate that academic supervision is effective in guiding teachers to adopt instructional practices that are consistent with the principles of deep learning. Likewise, the findings support Tomlinson's (2017) theory of differentiated instruction, showing that adapting instruction to students' readiness, interests, and learning profiles results in more inclusive and meaningful learning experiences.

The present findings are also supported by empirical studies done before. Abdurrahman et al. (2024) in their research indicated that systematic academic supervision helped teachers improve their instructional performance by providing structured planning, classroom observation, and continuous feedback. Likewise, Mediatati and Jati (2022) found that academic supervision increased teachers' abilities in planning, conducting, and evaluating instruction. Furthermore, Maulana and Suryana (2023) found that supervision led to more effective instructional strategies, classroom management, and the use of instructional tools. The present study adds to these findings by showing that academic supervision not only improves teachers' professional competence, but also enables the implementation of deep learning in an inclusive educational environment, contributing to better learning outcomes for students with special educational needs. Another important finding of this study is that the effectiveness of academic supervision is reflected not only in the professional growth of teachers but also in the increase of the participation of students throughout the learning process. In Cycle II, students were more confident in expressing their ideas, participating in discussions, responding to the teachers' questions and completing the learning tasks within their abilities. These behavioral changes suggest that higher quality instruction promotes a more inclusive classroom climate in which students are more actively engaged in knowledge construction. This observation points to a reciprocal relationship between teacher competence and student learning, implying that the development of teachers' pedagogical practices is essential for meaningful learning in inclusive classrooms.

In summary, the results support the academic supervision by the principal as an effective professional development approach to enhance teachers' perceptions and use of deep learning in inclusive elementary schools. Meeting all pre-set success indicators at the end of Cycle II demonstrates that systematic supervision, which involves classroom observation, reflective dialogue, constructive feedback and sustained follow-up, can make a significant impact on improving the quality of instruction and supporting meaningful learning experiences for students with special educational needs. The results confirm the important role of principals as instructional leaders who provide professional support for improving the quality of education and promoting inclusive education constantly.

CONCLUSION

The results of this School Action Research indicate that the principal's academic supervision has been able to improve the quality of classroom instruction in the inclusive setting of SD Negeri 008 Kombeng. The systematic supervision process of planning, classroom observation, reflective feedback, and continuous follow-up enabled the teacher to improve pedagogical competence in designing, implementing, and evaluating instruction that met the learning needs of students with special educational needs. The improvement is reflected in the increase of instructional quality from 51% in the pre-action stage to 69% in Cycle I and 83% in Cycle II, indicating that academic supervision is an effective strategy to improve the professional practice of teachers. In addition, the implementation of academic supervision improved the quality of instruction given by the teacher, which helped to improve the deep learning outcomes of students with special educational needs. As instructional practices became more student-centered, meaningful and adaptive, students showed an increased ability to understand concepts, relate new knowledge to prior experiences, explain ideas in their own words, and to apply learned knowledge in simple contexts. These improvements can be reflected in the increase of students' deep learning outcomes from 44% in pre-action stage to 64% in Cycle I and 79% in Cycle II. Therefore, the results confirm the fact that the principal's academic supervision is an effective professional development strategy to improve the quality of instruction while supporting the implementation of deep learning in inclusive elementary schools.

School principals are encouraged to consider academic supervision as a continuous, systematic, and collaborative professional development process, rather than just an evaluative activity. School leadership practices should involve continuous observation of classrooms, constructive feedback, reflective discussions and ongoing follow-up as a means of strengthening teachers' pedagogical competence and to ensure that principles of deep learning are consistently implemented in inclusive classrooms. Teachers are encouraged to constantly improve their competence in the development and implementation of differentiated, student-centered teaching, taking into account the diverse characteristics of students with special educational needs. Greater emphasis on innovative instructional strategies, use of varied learning media, encouraging active student participation, and integration of meaningful, mindful, and joyful learning principles to promote deeper conceptual understanding. Schools must provide institutional support for the practice of sustainable academic supervision by offering professional development programs, providing adequate instructional resources, and developing a collaborative professional culture among teachers and school leaders. This support will help to improve the quality of instruction and strengthen the implementation of inclusive education through more effective and meaningful teaching and learning practices.

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