Teaching and General Education Studies
E-ISSN 3123-495X
Doi xxx-xxx
Vol 2 No 1 2026

IMPLEMENTATION OF THE CTL MODEL TO IMPROVE ELEMENTARY SCHOOL STUDENTS' SCIENCE LEARNING OUTCOMES

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Accepted : December,20 2025

Abstract: This study examines the implementation of the Contextual Teaching and Learning (CTL) model in Natural Science (IPA) instruction and evaluates its effectiveness in improving elementary school students' learning outcomes. The study is grounded in the problem of low science achievement among students, which is primarily caused by teacher-centered learning practices that limit students' active engagement and understanding of scientific concepts. The research employed Classroom Action Research (CAR) based on the Kemmis and McTaggart model, which was conducted in two cycles comprising planning, action, observation, and reflection stages. The subjects of this study were elementary school students who had not yet achieved the Minimum Competency Criteria (KKM) in science learning. Data were collected through classroom observations, interviews, documentation, and achievement tests to obtain comprehensive information on both the learning process and learning outcomes. The results demonstrate a significant improvement in students' science learning outcomes following the implementation of the CTL model. In the initial condition, most students scored below the KKM. After the first cycle, the learning completion rate reached 44%, indicating a moderate improvement. Subsequent revisions to the learning process through the systematic application of CTL components including constructivism, inquiry, questioning, learning communities, modeling, reflection, and authentic assessment—led to a substantial increase in learning outcomes in the second cycle, with mastery learning reaching 88%. These findings indicate that CTL effectively promotes active learning, contextual understanding, and the ability to relate scientific concepts to real-life situations. In conclusion, the Contextual Teaching and Learning model is effective in improving elementary school students' science learning outcomes. This study provides practical benefits for teachers by offering an alternative instructional approach that supports active, meaningful, and student-centered learning in elementary science classrooms.
Keywords: *CTL, learning outcomes, science, elementary school, classroom action research.*

INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process in which students actively develop their potential to possess spiritual-religious strength, self-control, personality, intelligence, noble character, and the skills needed for themselves, society, the nation, and the state. (Republic of Indonesia, 2003)

Science learning in elementary schools has a primary function in shaping the personality and reasoning abilities of students from an early age (Ratna, 2025). Scientific literacy is a fundamental skill in science learning in elementary schools, which not only focuses on understanding natural concepts but also builds students' personalities (Chairan, 2025).

Many fifth-grade students still struggle to understand their teachers' explanations. This may be due to teachers still using monotonous teaching methods that lack student interest and seem boring. As a result, students remain focused on the teacher during the learning process, rarely engaging actively during the learning process, and not participating actively in class.

As a result, student learning outcomes in science have not met expectations. Many students lack understanding, resulting in scores often falling below the Minimum Competency (KKM). Therefore, during interviews, homeroom teachers requested a learning model to improve student learning outcomes.

To address the challenges faced by fourth-grade science students, innovative learning models and approaches are needed to enhance student understanding. Furthermore, using the Contextual Teaching and Learning (CTL) model can encourage active interaction between students and allow them to participate in discussions. This way, students can exchange ideas and insights throughout the teaching and learning process.

Contextual learning is the knowledge of a teacher who must be able to create a learning style that helps teachers connect the material being taught with the real-world conditions of students and encourages students to make connections between the knowledge they have and its application in their lives as members of the family and society (Nababan 2023).

In the implementation of contextual learning, it can be useful to improve the understanding of science concepts through real and relevant learning experiences and help teachers create more interesting, active, and meaningful learning. The CTL learning model can improve the learning outcomes of fifth grade students and help students build understanding based on their real experiences.

This research is important because improving science learning outcomes in elementary schools plays a direct role in strengthening students' scientific literacy and supporting the development of critical thinking and scientific reasoning skills on an ongoing basis. Furthermore, this research is expected to provide practical contributions for teachers in selecting and implementing learning models that are realistic, effective, innovative, and student-centered. Theoretically, the results of this study can enrich studies on the application of the Contextual

Teaching and Learning (CTL) model in science learning in elementary schools, while practically, this research can serve as a reference in efforts to improve the quality of learning and student learning outcomes.

METODOLOGI

Research Design

This research employed a Classroom Action Research (CAR) method using a quantitative approach to improve students' learning outcomes through systematic instructional interventions. Classroom Action Research is a reflective process conducted by teachers or researchers in the classroom with the aim of improving instructional practices and student achievement (Kemmis & McTaggart, 2014). The CAR design followed the Kemmis and McTaggart spiral model, which consists of four stages: planning, action, observation, and reflection, implemented in two cycles. Each cycle was designed based on reflections from the previous cycle to address identified instructional problems and enhance learning effectiveness.

Quantitative data were collected to measure students' learning outcomes through pre-tests and post-tests administered in each cycle. The pre-test was conducted to identify students' initial abilities before the implementation of the instructional action, while the post-test was used to evaluate the effectiveness of the applied learning strategy. According to Burns (2010), the use of pre-test and post-test in action research allows researchers to systematically examine changes in learning outcomes resulting from instructional interventions. The data obtained from each cycle were analyzed descriptively to determine improvements in students' learning achievement and to inform further instructional planning. Through this cyclical and reflective process, Classroom Action Research enables continuous improvement of teaching practices and supports the enhancement of student learning outcomes (Creswell, 2012).

Research Subject and Location

This research was designed using a quantitative method with a pre-experimental approach, and this research was conducted in the even semester of the 2025 academic year. The subjects of the research were fifth-grade students at Sukamaju State Elementary School. Fifth-grade students were pre-subjects of the research, fifth-grade teachers as observers, one of the researchers as a documentation team, and the author as an instructor.

Data Collecting

The data collection techniques generally used are:

a. Interview Technique

   Interview Technique Interview technique is a data collection method conducted through direct question and answer sessions between researchers and students to obtain information relevant to the research objectives.

b. Observation technique

   Observation technique is a method of collecting data by directly observing the object being studied, whether it is an individual, behavior, or a particular situation, to obtain accurate and objective data.

c. Documentation techniques

   Documentation techniques are a method of collecting data using various written documents or archives, images or recordings related to the research object.

d. Testing techniques

   Testing techniques are data collection methods carried out by giving questions to students to measure their abilities, knowledge, skills, attitudes or learning achievements according to the research objectives.

Data Analysis

The data obtained in this study were analyzed using quantitative data analysis techniques. Qualitative data analysis is the process of processing and interpreting non-numerical data (such as observations, interviews, and documentation) to draw meaningful conclusions about the phenomenon being studied. with a student score percentage of 44% and students there were 9 students who did not complete and reached the KKM score with a percentage of 56% of students who did not complete more than students who completed.

RESEARCH RESULT

Finding

No	Student Name	Grade	Description
1	S-1	100	Complete
2	S-2	100	Complete
3	S-3	85	Complete
4	S-4	80	Complete

5	S-5	90	Complete
6	S-6	85	Complete
7	S-7	95	Complete
8	S-8	90	Complete
9	S-9	70	Not Completed
10	S-10	85	Complete
11	S-11	100	Complete
12	S-12	75	Complete
13	S-13	90	Complete
14	S-14	70	Not Completed
15	S-15	100	Complete
16	S-16	95	Complete
Jumlah		1410	
Rata-rata		88%	
Kategori		Baik Sekali	

Table 2.1 Post-Test

Table 2.1 is an analysis of student learning outcomes in cycle II, student learning outcomes in Natural Science in cycle I can be presented at 60% with a sufficient category. The assessment is carried out according to or following the assessment guidelines on the left-hand side of the question and Module, the KKM value for Science subjects in grade IV at State Elementary School is 75. In cycle II there were 14 students who completed and achieved KKM with a percentage of 88% and there were 2 students who did not complete and achieved the KKM value with a percentage of 12% of students who did not complete more than students who completed. Therefore, it appears that the research has achieved good results because it has increased and the research was only carried out until cycle II.

The improvement in student learning outcomes after implementing the model during cycle II can be seen as follows:

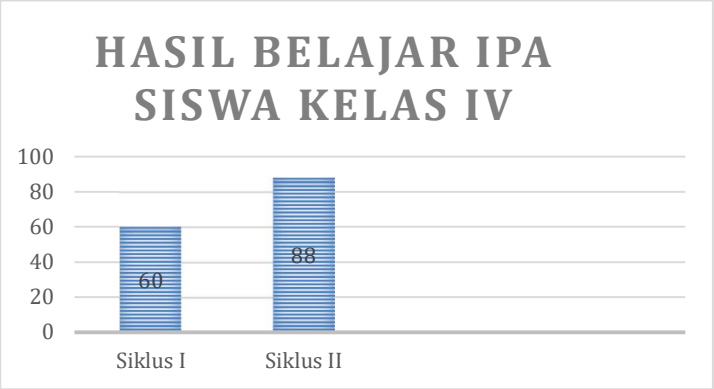

Figure 2.2 Diagram of Student Learning Outcomes in the Learning Process

Discussion

The findings of this study indicate a significant improvement in students' learning outcomes in Natural Science after the implementation of the learning model during Cycle II. Based on the data presented in Table 2.1, student learning outcomes in Cycle I reached 60%, which fell into the sufficient category. This result suggests that students had not yet fully achieved the expected learning competencies, as many still scored below the Minimum Competency Criteria (KKM) of 75 for Grade IV students at the State Elementary School. According to Arikunto (2019), initial cycles in Classroom Action Research often show moderate results because students are still adjusting to new learning strategies and classroom dynamics.

A substantial improvement was observed in Cycle II. The data show that 14 students (88%) achieved the KKM, while only 2 students (12%) did not meet the mastery criteria. This improvement indicates that the learning objectives were successfully achieved. This finding is consistent with the views of Kunandar (2018), who states that repeated cycles in Classroom Action Research allow teachers to refine instructional practices, leading to improved student understanding and learning outcomes. The enhanced performance in Cycle II reflects the effectiveness of instructional revisions made based on reflections from Cycle I.

Furthermore, the improvement in learning outcomes is supported by Figure 2.2, which visually demonstrates the increase in mastery learning from Cycle I to Cycle II. The diagram shows a clear upward trend in the number of students who achieved mastery learning, accompanied by

a decrease in the number of students who did not meet the KKM. This aligns with constructivist learning theory, which emphasizes that students learn more effectively when they are actively engaged in the learning process and are given opportunities to connect new knowledge with prior experiences (Vygotsky, 1978; Trianto, 2017).

Overall, the findings confirm that the learning model applied in this study was effective in improving students' Natural Science learning outcomes. Since the percentage of students achieving mastery learning exceeded the predetermined success indicator of 75%, the research was concluded at Cycle II. These results support previous studies suggesting that well-planned and reflective instructional interventions can significantly enhance students' academic achievement and classroom learning quality (Kemmis & McTaggart, 2014).

CONCLUSION

Based on the classroom action research conducted through two cycles in the science learning process using the Contextual Teaching and Learning (CTL) model, it can be concluded that the implementation of the CTL model successfully improved the science learning outcomes of fourth-grade students at SD Negeri Sukamaju.

In the initial condition (pre-test), the average student learning outcome was 60% with a mastery level of 44%. This indicates that most students still experienced difficulties in understanding science concepts. After implementing the CTL model in Cycle II, there was a significant improvement, as shown by the increase in the average score to 88% and learning mastery reaching 88%. This means that the majority of students successfully achieved the minimum mastery criterion (KKM), which is 75.

This improvement occurred because the CTL model was able to connect science learning with students' real-life contexts through various activities such as observations, discussions, simple experiments, and reflections. These activities made students more active, enabled them to understand concepts more deeply, and encouraged direct involvement in the learning process. This finding aligns with Apriani (2018) and Rusman (2012), who state that CTL helps students relate learning materials to real-life situations, making learning more meaningful and effective. Thus, it can be concluded that the implementation of the CTL model is effective in improving learning outcomes, students' activeness, and their understanding of science concepts in elementary school. This model is recommended as an alternative instructional approach for teachers to create more contextual, active, and engaging science learning experiences.

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