The Application of the Inquiry Learning Model to Enhance Critical Thinking Skills in Science and Social Studies (IPAS) Instruction for Grade III Students at SD Negeri 3 Kota Mobagu

Rabiatul Adawiah Harinny Albuchari[1*], Supit Pusung[2], Juliana Margareta Sumilat[3]

[1,2,3]Fakultas Ilmu Pendidikan dan Psikologi, Universitas Negeri Manado, Indonesia
Corresponding author:
Email: albuchariwiaa@gmail.com

Abstract

This classroom action research aimed to improve students' critical thinking skills through the Inquiry Learning model in Natural and Social Sciences (IPAS) lessons on heat energy sources in Grade III at SD Negeri 3 Kotamobagu. The study was conducted in two cycles with 29 students, each cycle consisting of planning, action, observation, and reflection. Data were collected through an essay test based on five of Ennis' critical thinking indicators (Focus, Reason, Inference, Situation, Clarity) and through observation of teacher and student activities. In Cycle I, the mean critical thinking score was 58.10, with classical mastery (minimum category Good, score ≥ 60) of 51.72%; student activity was 66.25% and teacher activity was 71.43%, both in the Good category. After improvements in Cycle II, namely stronger teacher guidance, guiding questions, and greater student involvement in inquiry activities, the mean score rose to 77.76 with classical mastery of 93.10%; student activity increased to 88.75% and teacher activity to 91.96%, both in the Very Good category. Based on the school's learning objective achievement criterion (score ≥ 75), classical mastery rose from 24.14% to 72.41%, which is still below the 75% target. These results indicate an improvement in students' critical thinking after the implementation of the Inquiry Learning model.

Keywords: *Inquiry Learning Model, Critical Thinking Skills, Natural and Social Sciences (IPAS).*

I. INTRODUCTION

Education is essentially a deliberate and well-prepared effort to create a supportive learning environment, so that each student has the opportunity to hone their abilities. These abilities encompass a wide range of aspects, from spiritual strength and self-control, personality traits, intellectual development, and commendable behavior to practical skills that are invaluable for both their personal lives and their contributions to the wider community. In line with this, education is also seen as a form of support for students, enabling them to assume responsibility and complete life's tasks independently (Pristiwanti et al. 2022).

Critical thinking is a crucial competency in 21st-century learning. In the Independent Curriculum, critical reasoning skills are a dimension of the Pancasila Student Profile. Ennis (2011) defines critical thinking as reflective and rational thinking focused on decisions about what to believe or do. Therefore, learning should provide opportunities for students to observe, ask questions, use evidence, provide reasons, and draw conclusions.

The science subject itself is a combination of science and social studies disciplines that was recently implemented through the independent learning curriculum policy.Nababan, et.al (2026:188).Natural and Social Sciences (IPAS) learning has an important role in helping students understand natural phenomena that occur around them, including global issues such as climate change.Sumilat, et.al (2025 : 11922)

However, based on the results of observations and evaluations by observing the learning process of students carried out by researchers at SD Negeri 3 Kotamobagu in the subject of Natural Sciences, in the material on heat energy sources in class III, there were problems in the learning process, includingClassroom learning is often teacher-centered, resulting in students being passive and lacking the skills to reason. Students still struggle to analyze information, express opinions, connect material to everyday life, and draw conclusions from observations. These findings indicate that students' critical thinking skills need to be improved.

Inquiry Learning is an alternative to addressing these issues because it positions students as active observers, formulating problems, proposing hypotheses, collecting data, testing hypotheses, and drawing conclusions (Irwandi, 2020). In this study, the inquiry stages were adapted for third-grade students (Phase B) into five steps: orientation and initial observation, formulating questions, collecting data or conducting investigations, processing data and presenting results, and drawing conclusions. These steps align with Ennis's critical thinking indicators known as the FRISCO framework: Focus, Reason, Inference, Situation, Clarity, and Overview. Orientation and question formulation train students to focus on the core issue (Focus); investigation and data processing require students to provide reasons based on evidence (Reason) and use all available information (Situation); drawing conclusions trains students to draw accurate conclusions from data (Inference); and presentation of results and reflection trains students to explain their ideas clearly with examples (Clarity).

Based on several previous studies, the application of the Inquiry Learning model in science learning has shown potential in improving students' critical thinking skills. However, there is still a research gap in the application of the Inquiry Learning model that specifically focuses on thermal energy material in elementary schools. Thermal energy material not only requires students to understand the concept, but also encourages students to identify problems, provide reasons, draw conclusions based on the information obtained, and connect the concept to situations in everyday life. Therefore, learning is needed that can provide opportunities for students to be actively involved in the process of discovering and proving a concept.

Septina et.al.'s (2026) study examined the improvement of students' critical thinking skills in science subjects through the application of the inquiry learning model. The study used classroom action research and reported an improvement in critical thinking skills after the application of the inquiry model. This study is relevant because it also uses the inquiry model in science learning to improve students' critical thinking skills. The differences lie in the subject, class, and context of the learning material studied. This study was specifically conducted on third-grade students of SD Negeri 3 Kotamobagu with the topic of heat energy sources.

Sunarti et al. (2023) examined the influence of the Guided Inquiry learning model on the critical thinking skills and science learning outcomes of elementary school students. This research is relevant because it demonstrates the importance of guided inquiry learning in providing opportunities for students to observe, ask questions, seek information, and draw conclusions based on the results of investigations. The similarity lies in the use of an inquiry approach to develop students' critical thinking skills. The difference is that previous research focused on Guided Inquiry in science learning, while this study applies the Inquiry Learning model to the third grade science subject with the topic of heat energy sources.

Although previous research has discussed the application of the inquiry model in science and science learning, more specific studies are needed regarding its application in third-grade elementary school students, especially in science learning on the topic of heat energy sources. In addition, this study is not only directed at observing critical thinking skills in general, but also to examine their development based on measurable indicators during the learning improvement process. Thus, the research gap in this study lies in the need to describe the application of Inquiry Learning in the context of the class, material, and level, while also examining the development of students' critical thinking skills through learning activities implemented in stages.

Furthermore, many studies on critical thinking skills measure students' abilities in general or use different indicators. Research specifically examining students' critical thinking skills through Ennis's five indicators (Focus, Reason, Inference, Situation, and Clarity) in the application of the Inquiry Learning model to heat energy in elementary schools is still limited. This gap underpins this study.

The purpose of this study is to improve the critical thinking skills of third-grade students of SD Negeri 3 Kotamobagu in science learning on the topic of heat energy sources through the application of the Inquiry Learning model. This study is expected to be an alternative in improving students' critical thinking skills and contribute to improving the quality of science learning in elementary schools.

The inquiry learning model is a technique used by teachers to guide students through the learning process by encouraging them to ask questions, engage in problem-solving activities, and provide critical feedback. Furthermore, the inquiry learning model encourages students to thoroughly investigate and solve problems using systematic, critical, logistical, and analytical methods as part of their learning objectives (Setyorini, 2020:5).

The inquiry-based learning model encourages students to participate in question-and-answer sessions, collect data, and conduct investigations. Students are fully responsible for their implementation, offering comments or asking questions about the investigation, formulating hypotheses for analysis, gathering and organizing information needed to test the hypotheses, and drawing conclusions.

II. RESEARCH METHODS

This research is a Classroom Action Research (CAR) that refers to the Kemmis and McTaggart design in Aqib and Chotibuddin (2018). The research was conducted through four interrelated stages: planning, acting, observing, and reflecting. These four stages were implemented repeatedly in two cycles to improve the learning process and enhance students' critical thinking skills. The flow of the classroom action research is shown in Figure 1.

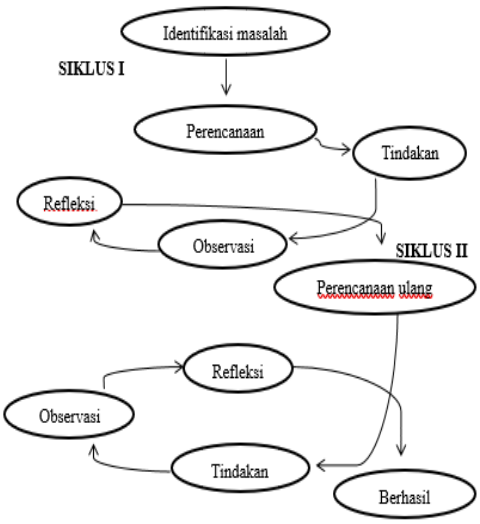


Fig 1. Flow of Kemmis and McTaggart's Modified Classroom Action Research

This research was conducted at SD Negeri 3 Kotamobagu, located on Jl. Mawar, Kotamobagu, Kotamobagu Bar. District, Kotamobagu City, North Sulawesi Province. The subjects were 29 third-grade students, consisting of 16 boys and 13 girls. Cycle I was conducted on June 18, 2026, and Cycle II on July 7, 2026.

This classroom action research was conducted in two cycles. Each cycle included planning, action implementation, observation, and reflection.

In the planning stage, the researcher prepared a science teaching module on the material of heat energy sources, teaching materials, Student Worksheets (LKPD), learning media, evaluation questions, critical thinking ability assessment rubrics, and observation sheets for teacher and student activities.

In the implementation stage of the action, learning is carried out by applying the Inquiry Learning model through five steps adapted to the characteristics of grade III students, namely (1) orientation and initial observation, (2) formulating questions, (3) collecting data or conducting investigations, (4) processing data and presenting results, and (5) drawing conclusions. In these activities, students are directed to observe the phenomenon of heat energy sources, ask questions, conduct investigations, discuss the results of observations, present results, and draw conclusions based on the information obtained.

During the observation phase, observers observed teacher and student activities during the learning process using an observation sheet. Students' critical thinking skills were measured through five descriptive questions assessed using a scoring rubric based on Ennis' five critical thinking indicators.

In the reflection stage, researchers analyzed the results of critical thinking skills tests and observations to identify obstacles and learning aspects that needed improvement. The results of the Cycle I reflections were used as the basis for improvements in Cycle II. Improvements were directed at providing more focused prompting questions, guidance during investigations, and greater opportunities for students to discuss and present their results. The results of the Cycle II tests and observations were then analyzed to determine changes in students' critical thinking skills after the corrective actions.

The instruments used in this study included teacher activity observation sheets, student activity observation sheets, and a critical thinking skills test. The teacher activity observation sheets were used to obtain data on the implementation of learning and the teachers' ability to manage learning using the Inquiry Learning model. Observers completed the sheets by placing checkmarks according to the activities observed during the learning process.

The student activity observation sheet was used to obtain data on student engagement in the science learning process on heat energy sources. The observation aspects were aligned with the learning steps outlined in the teaching module. Student activity observations were conducted by a peer.

The critical thinking ability test consists of five descriptive questions, each representing one of Ennis's (2011) critical thinking indicators: Focus, Reason, Inference, Situation, and Clarity. The Focus indicator relates to the ability to understand a problem; Reason relates to providing reasons based on facts or evidence; Inference relates to drawing conclusions; Situation relates to the use of relevant information; and Clarity relates to the ability to provide clear explanations.

Each question is given a score of 1–4 based on the assessment rubric, so the maximum score is 20. Assessment is carried out by paying attention to the accuracy of the answer, the reasons given, the appropriateness of the conclusion, the use of available information, and the clarity of the student's explanation.

$$P = \times 100\frac{F}{N}$$

Information:
P = percentage number
F = achievement score
N = maximum score
(Source: Arikunto, 2017)

Research data were collected through tests and observations. A critical thinking ability test consisting of five descriptive questions was given at the end of each cycle of learning to determine students' critical thinking ability scores. Observations were conducted throughout the learning process to obtain data on teacher and student activities in implementing the Inquiry Learning model. Data were analyzed descriptively and quantitatively. The analysis included each student's critical thinking ability score, the percentage of classical critical thinking ability achievement, and the percentage of teacher and student activity. Data on teacher and student activity were obtained from observation sheets completed during the learning process. The percentage of activity was calculated using the formula:

$$P = \times 100\frac{F}{N}$$

Information:
P = percentage number
F = achievement score
N = maximum score
(Source: Arikunto, 2017)

The calculation results were then grouped based on the categories used in the study. Each student's critical thinking ability score was calculated based on their scores on five essay questions with a maximum score of

20. Furthermore, the scores were grouped into five categories: very good, good, sufficient, poor, and very poor. The classical achievement of critical thinking ability was calculated based on the number of students who achieved at least the good category, with the formula:

$$\text{Formula:KBK} = \frac{\text{Ti}}{\text{Ts}} \times 100\%$$

Information :

KBK : Achievementstudents' critical thinking skills in learning (good & very good classification)

Ti : Number of research samples that achieved critical thinking skillsat least good

Ts : Number of research samples

After the data was presented as a percentage, the results were classified according to the critical thinking ability category criteria adapted from Ridwan in Khasanah & Ayu (2017) in Table 1. The same criteria were used to categorize the percentage of teacher and student activities.

Table 1. Criteria for Critical Thinking Skills Categories and Teacher/Student Activities

Score Interval/Percentage (%)	Category
80–100	Very good
60–79	Good
40–59	Enough
20–39	Not enough
0–19	Very less

III. RESEARCH RESULT

The research results were obtained from the application of the Inquiry Learning model to improve students' critical thinking skills in science learning on heat energy sources in grade III of SD Negeri 3 Kotamobagu. The research was conducted through two cycles with the aim of improving students' abilities in observing, analyzing, and drawing conclusions about heat energy sources through investigation activities.

The research results are presented based on the implementation of actions in Cycle I and Cycle II which include the planning, implementation, observation and reflection stages.

The results of observations of teacher and student activities are presented in Table 2. Student activity increased from 66.25% (Good) in Cycle I to 88.75% (Very Good) in Cycle II, while teacher activity increased from 71.43% (Good) to 91.96% (Very Good).

Table 2. Results of Observations of Student and Teacher Activities

Aspect	Cycle I	Cycle II	Improvement
Student activities	66.25% (Good)	88.75% (Very Good)	22.50 points
Teacher activities	71.43% (Good)	91.96% (Very Good)	20.53 points

The results of the science learning on heat energy sources through the application of the Inquiry Learning model were obtained from an evaluation conducted at the end of the lesson. The evaluation was conducted using an assessment sheet given to third-grade students of SD Negeri 3 Kotamobagu and described teacher and student activities during the lesson. This assessment was designed to measure students' critical thinking skills, based on Ennis's five critical thinking indicators: Focus, Reason, Inference, Situation, and Clarity.

Furthermore, the assessment is used to determine the extent to which students understand the concept of heat energy sources and apply the results of their investigations to answer questions posed after participating in the Inquiry Learning model. The evaluation results serve as a basis for determining students' level of critical thinking skills in cycle I and serve as reflection material for improving learning in subsequent cycles.

DISCUSSION

The results of the study showed that the application of the Inquiry Learning model in science learning on the topic of heat energy sources increased student activity, teacher activity, and critical thinking skills of grade III students at SD Negeri 3 Kotamobagu.

In Cycle I, observation results showed that student activity achieved a percentage of 66.25% with a Good category. Students began to engage in learning activities, but there were still some students who were less active in asking questions, expressing opinions, discussing, analyzing observation results, and drawing conclusions. Teacher activity achieved a percentage of 71.43% with a Good category. Teachers have implemented the learning stages according to the syntax of the Inquiry Learning model, but still need improvement in providing guidance, motivation, and questions that can encourage students to think more critically during the investigation process.

The results of the critical thinking ability assessment in Cycle I showed an average score of 58.10. A total of 15 students (51.72%) had achieved completion, while 14 students (48.28%) had not achieved completion. Based on the critical thinking ability category, there were 4 students (13.79%) in the Very Good category, 11 students (37.93%) in the Good category, and 14 students (48.28%) in the Sufficient category. These results indicate that the application of the Inquiry Learning model has been able to develop students' critical thinking abilities, although the research success indicator has not been achieved because the percentage of completion is still below the set target.

Based on the reflection results from Cycle I, various improvements were made in Cycle II, including improving the quality of guidance during inquiry activities, providing prompting questions that encourage students to analyze and justify each answer, increasing opportunities for discussion and presentation of inquiry results, and utilizing more engaging and contextual learning media. These improvements aim to make students more active in discovering concepts independently through the Inquiry Learning stage.

The results of the actions in Cycle II showed improvement. Student activity increased as students were more active in observing, asking questions, gathering information, discussing, expressing opinions, and drawing conclusions based on the results of their investigations. Teacher activity also improved with the implementation of all stages of Inquiry Learning more systematically and effectively, resulting in a more interactive and student-centered learning process.

This improvement was also seen in students' critical thinking skills in cycle II. The average critical thinking skill score increased to 77.76. A total of 27 students (93.10%) had achieved completion, while only 2 students (6.90%) had not achieved completion. Based on the critical thinking skill category, 17 students (58.62%) were in the Very Good category, 10 students (34.48%) were in the Good category, and 2 students (6.90%) were in the Sufficient category. These results indicate that most students were able to understand the given problem, provide reasons based on facts/evidence, draw conclusions correctly, use all appropriate information related to the problem, and use further explanations regarding what was meant in the conclusions made.

An analysis of Ennis's critical thinking indicators is presented in Table 7. The average score for each indicator (scale 1–4) increased from Cycle I to Cycle II. The largest increases occurred in the Reason (+22.4 percentage points) and Inference (+21.6) indicators, which is in line with improvements in Cycle II in the form of trigger questions that require students to analyze and provide reasons. The smallest increase occurred in the Situation indicator (+15.5), while the Focus indicator remained the lowest in Cycle II (73.3%), thus requiring attention in further research or learning.

Table 7. Average Score per Critical Thinking Indicator

Indicator	Cycle I Average	Cycle II Average	% Cycle I	% Cycle II	Go on
Focus	2.17	2.93	54.3	73.3	+19.0
Reason	2.24	3.14	56.0	78.4	+22.4
Inference	2.24	3.10	56.0	77.6	+21.6

Situation	2.48	3.10	62.1	77.6	+15.5
Clarity	2.48	3.28	62.1	81.9	+19.8

Based on the school's Learning Objectives Achievement Criteria (KKTP) with a score of ≥ 75, the number of students who completed the program was 7 out of 29 students (24.14%) in Cycle I and 21 out of 29 students (72.41%) in Cycle II. With the research success criteria (minimum category Good, score ≥ 60), completion reached 51.72% in Cycle I and 93.10% in Cycle II. Both measures showed improvement. However, completion based on KKTP in Cycle II (72.41%) was still below the target of 75%. Thus, the research success indicator has been achieved, but achievement of the school's KKTP standards has not been fully optimal, so learning reinforcement is needed, especially for students who have not completed it, or further research is needed.

This study has limitations: it was conducted in a single class without a comparison group, and the initial data consisted of an evaluation of science learning outcomes (not a measurement of critical thinking skills using the same instrument as the cycle instrument). Improvement may also be influenced by factors external to the intervention, such as students' familiarity with the question format in the second cycle. Therefore, the improvements obtained are descriptive in nature and cannot be generalized.

The improvement in critical thinking skills from Cycle I to Cycle II demonstrates that the Inquiry Learning model is capable of creating more meaningful learning because students are directly involved in the process of discovering concepts through observing, asking questions, investigating, analyzing, and drawing conclusions. This condition aligns with the characteristics of the Inquiry Learning model, which emphasizes scientific thinking processes, so that students not only receive information from the teacher but also construct their own knowledge through learning experiences.

Based on the established success indicators (classical completion in the minimum category of Good ≥ 75%), the study was stopped in Cycle II because the classical completion (93.10%) had exceeded the target of 75%. This increase is thought to be related to the students' active involvement during learning, namely not only receiving information from the teacher, but also observing problems, asking questions, collecting information, analyzing data, and drawing conclusions based on the results of the investigation.

A teacher's success in the teaching and learning process is when his students understand and comprehend what he conveys, which indicates that students experience an increase in learning outcomes. To achieve ideal learning outcomes, teachers are required to be able to guide their students in the learning process. A teacher must always be prepared for various conditions in dealing with students and their environment, and must also have high competence to be able to carry out their duties as exemplary teachers in order to create quality human resources. Teachers in schools play a very important role in searching, finding, selecting, and using appropriate teaching aids or media that are appropriate to the child's condition to support the smooth running and achievement of learning objectives. Pusung, S., & Pati, LA (2023: 991)

Furthermore, the results of this study are also supported by research by Pasaribu, Pusung, and Rorimpandey (2026), which states that each student's critical thinking skills develop at different rates. Therefore, a learning approach that provides guidance tailored to each student's needs is needed to optimally develop their critical thinking skills. This is evident in the application of the model.*Inquiry Learning*In this study, the teacher not only provided students with opportunities to discover concepts independently but also provided guidance and support to students who were still experiencing difficulties in the investigation process. Through this guidance, students became more confident in expressing opinions, analyzing information, and drawing logical conclusions from learning outcomes. Consequently, students' critical thinking skills gradually improved until they reached the success indicator in Cycle II.

The research of Simanjuntak et al. (2022) also supports the results of this study. They examined the application of the Inquiry Learning model assisted by interactive media to improve elementary school students' critical thinking skills on the topic of changes in form and energy. The results of the study showed a significant difference between the experimental group and the comparison group. This finding reinforces the importance of using inquiry learning to provide opportunities for students to understand the material and

develop critical thinking skills. The similarity with this study is the use of the inquiry model in science learning in elementary schools. The difference lies in the use of interactive media in the Simanjuntak et al. study, while this study emphasizes improving learning implementation through reflection at each cycle.

Kisworo, Wibawa, and Fauziah (2023) conducted a study entitled "Analysis of the Application of the Discovery Inquiry Learning Model to Improve Critical Thinking Skills in Science Subjects in Elementary Schools." This study discusses the application of discovery inquiry learning to improve the critical thinking skills of elementary school students. The results showed that students' critical thinking skills were in the critical and very critical categories, with reported percentages reaching 80% and 90%. This study is relevant because both studies discuss inquiry-based learning and critical thinking skills in science subjects. The difference lies in the learning model used, namely Discovery Inquiry, while this study uses the Inquiry Learning model for third-grade students.

The study entitled "Implementation of the Guided Inquiry Model to Improve Critical Thinking Skills and Science Learning Outcomes about Me and My Needs in Fourth Grade Students of SDN 1 Adikarso" discusses the use of the guided inquiry model in science learning. The results showed that the percentage of critical thinking skills increased to 86.7% in cycle III. These findings indicate that student involvement in investigation, discussion, and conclusion-drawing activities can support the development of critical thinking skills. The similarity with this study is the use of an inquiry approach to improve critical thinking skills in science learning. The differences lie in the grade level, learning materials, and stages of the model applied.

Dah et al. (2024) conducted a systematic review entitled "The Impacts of Open Inquiry on Students' Learning in Science: A Systematic Literature Review," published in Educational Research Review, 43, article 100601. This study analyzed 24 articles on the application of open inquiry in science learning. The results of the study indicate that inquiry learning has the potential to support students' conceptual understanding, scientific and thinking skills, motivation, and scientific literacy. This research is relevant because it provides international support for the use of inquiry learning to develop students' thinking skills. The difference is that the study was a systematic review of various science learning contexts, while this study is a classroom action research on third-grade elementary school students.

Meanwhile, Pohan and Indarini (2024) compared the Problem-Based Learning and Inquiry Learning models in improving critical thinking skills and science learning outcomes in elementary school students. Their results showed that Problem-Based Learning provided higher results than Inquiry Learning in the context of the study. This finding suggests that the success of a learning model can be influenced by student characteristics, materials, and learning implementation. Therefore, the results of this study do not mean that Inquiry Learning is always superior to other models. This study more specifically shows that improvements in the implementation of Inquiry Learning in two cycles in grade III of SD Negeri 3 Kotamobagu were followed by an increase in average scores and completion based on the category of students' critical thinking abilities.

Overall, the results of this study show that the application of the Inquiry Learning model accompanied by teacher guidance, investigation activities, discussions, presentations, and reflections can support the improvement of students' critical thinking skills in the material of heat energy sources. The increase in the average score from 58.10 to 77.76 and the increase in completeness based on the critical thinking ability category from 51.72% to 93.10% indicate that the indicators of research success based on these categories have been achieved. Thus, the Inquiry Learning model can be an alternative to improve the quality of science learning in elementary schools, while still paying attention to the suitability of the learning stages, student needs, and the assessment instruments used.

IV. CONCLUSION

Based on the results of classroom action research that has been carried out in two cycles, it can be concluded that the application of the Inquiry Learning model can improve students' critical thinking skills in science learning on the topic of heat energy sources in grade III of SD Negeri 3 Kotamobagu. This improvement is thought to be related to the characteristics of the Inquiry Learning model which provides

opportunities for students to be actively involved in the learning process through observing activities, formulating questions, collecting and analyzing information, expressing opinions, and drawing conclusions based on the results of the investigation. Through this process, students' critical thinking skills develop in each indicator, namely Focus (focusing attention on problems), Reason (providing logical reasons), Inference (drawing conclusions), Situation (using relevant information in solving problems), and Clarity (re-explaining the results of thinking clearly).

The success of the Inquiry Learning model implementation is demonstrated by the improvement of students' critical thinking skills from Cycle I to Cycle II. In Cycle I, the average score of students' critical thinking skills reached 58.10 with a classical completion of 51.72%, thus not meeting the research success indicators. After improvements were made in Cycle II through optimizing the implementation of the Inquiry Learning model steps, providing guidance during the investigation process, and increasing student involvement in discussions and presentations, the average score of critical thinking skills increased to 77.76 with a classical completion of 93.10%, thus the research success indicators have been achieved. However, based on the school's KKTP (score ≥ 75), classical completion in Cycle II only reached 72.41%, thus not meeting the 75% target.

In addition to improving students' critical thinking skills, the application of the Inquiry Learning model also improves the quality of the learning process, as demonstrated by increased teacher and student activity in each cycle. Thus, the Inquiry Learning model can create more active, meaningful, and student-centered science and science learning, making it an alternative learning model for improving elementary school students' critical thinking skills.

V. SUGGESTION

Teachers are advised to implement the Inquiry Learning model with targeted guidance and prompting questions, and to pay closer attention to the Focus indicators with the lowest achievement and to students who have not yet completed the course. Future researchers are advised to use a comparison group, the same initial instrument as the cycle instrument, and a larger number of subjects to generalize the results.

REFERENCE

[1]. Aqib, Z., & Chotibuddin. (2018). Classroom Action Research. Bandung: Yrama Widya.

[2]. Ardiatama, GI, Wahyudi, & Suhartono. (2024). Implementation of a guided inquiry model to improve critical thinking skills and science learning outcomes about Me and My Needs in fourth-grade students of SDN 1 Adikarso. Kalam Cendekia: ***Scientific Journal of Education***, 12(3).https://doi.org/10.20961/jkc.v12i3.85726

[3]. Arikunto, S. (2017). Research Procedures: A Practical Approach (Revised Edition). Jakarta: Rineka Cipta.

[4]. Dah, NM, Noor, MSAM, Kamarudin, MZ, & Syed Abdul Azziz, SS (2024). The impacts of open inquiry on students' learning in science: A systematic literature review. Educational Research Review, 43, Article 100601.https://doi.org/10.1016/j.edurev.2024.100601

[5]. Ennis, R.H. (2011). The Nature of Critical Thinking: An Outline of Critical Thinking Dispositions and Abilities. University of Illinois.

[6]. Irwandi. (2020). Learning Models and Strategies. Yogyakarta: CV. Budi Utama.

[7]. Khasanah, BA, & Ayu, ID (2017). Students' critical thinking skills through the application of the brain-based learning model. Eksponen, 7(2), 46-53.

[8]. Kisworo, TW, Wibawa, L., & Fauziah, PY (2023). Analysis of the application of the discovery inquiry learning model to improve critical thinking skills in science subjects in elementary schools. BADA'A: Scientific Journal of Elementary Education, 5(2), 160–178.https://doi.org/10.37216/badaa.v5i2.1236

[9]. Nababan, P., Pusung, S., & Katili, F. (2026). Application of Quantum Learning Model to Improve Learning Outcomes of Social Sciences Subject for Fifth Grade Students at Sd Inpres 4/82 Walian. ***Indo Green Journal***, 4(2), 186-194.

[10]. Pasaribu, LO, Pusung, S., & Rorimpandey, WH (2026). Implementation of Problem Based Learning Model to Improve Critical Thinking of Fifth Grade Students in Science Subject at SD Inpres 4/82 Walian. Indo Green Journal, 4(2), 1754-1761.

[11]. Pohan, TBR, & Indarini, E. (2024). The effectiveness of Problem Based Learning and Inquiry Learning models in improving critical thinking skills and elementary school science learning outcomes. Pendas: Scientific Journal of Elementary Education, 9(3), 216–233.https://doi.org/10.23969/jp.v9i03.17839

[12]. Pristiwanti, D., Badariah, B., Hidayat, S., & Dewi, RS (2022). Turnitin understanding education. Understanding Education, 4(6), 7911–7915.

[13]. Pusung, S., & Pati, LA (2023). Application of problem-based learning model to improve science learning outcomes of fourth-grade elementary school students. Wahana Pendidikan Scientific Journal, 9(19), 990-997.

[14]. Septina, C., Ananda, R., Pebriana, PH, Rizal, MS, & Joni. (2026). Improving students' critical thinking skills in science subjects using the inquiry learning model. Pendas: Scientific Journal of Elementary Education, 11(1), 50–62.https://doi.org/10.23969/jp.v11i01.38332

[15]. Setyorini, I. (2020). Inquiry Learning in the 2013 Curriculum. Yogyakarta: Pustaka Pelajar.

[16]. Simanjuntak, AL, Hermita, N., & Putra, ZH (2022). Application of inquiry learning model assisted interactive media on material shape and energy change to improve critical thinking skills of elementary school students. AL-ISHLAH: Journal of Education, 14(4), 7303–7318.https://doi.org/10.35445/alishlah.v14i4.2054

[17]. Sumilat, JM, Rotikan, AM, Maramis, JC, Manikome, AP, Kaligis, TI, & Wuisan, R. (2025). Implementation of Project-Based Learning to Improve Students' Engagement and Initial Understanding of Climate Change in Grade IV Elementary School: A Research. Journal of Community Service and Educational Research, 4(2), 11922-11928.

[18]. Sunarti, Nurlina, & Maaruf. (2023). The influence of guided inquiry learning models on students' critical thinking skills and science learning outcomes at the primary school level. Improvement: Scientific Journal for Improving the Quality of Educational Management, 10(2), 95–103.https://doi.org/10.21009/improvement.v10i2.37407.