
Implementing Inquiry Learning Model to Improve Primary Students' Critical Thinking Skills in Science Learning

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Abstract: This research aims to improve primary students' critical thinking skill through inquiry learning model in science learning. This research was classroom action research in two cycles with consist of planning, action, observation, and reflection. Each cycle consisted of two sessions. Data collection techniques were non-test and test. Data were analyzed using quantitative and qualitative analysis. The results of the research show the percentage of the critical thinking skill outcomes in first cycle is 66.67 % and second cycle is 80.55 %. The average teacher's skill in first cycle scored 26 (good category) and second cycle scored 33 (excellent category). The average in student's activity first cycle scored 69 (good category) and second cycle scored 91 (excellent category). In conclusion, implementing inquiry learning model can improve critical thinking skill primary students' critical thinking skill.

Keywords: Inquiry Learning model; Critical Thinking Skill; science learning.

1. Introduction

Science is a method of finding out about nature systematically; it is not only mastering a collection of knowledge in the form of facts, concepts, and principles, but also a process of discovery. Science education is expected to be a method for students to learn about themselves and the natural surroundings, as well as the prospect of further development in applying it in their daily lives. The learning process emphasizes giving direct experience to develop competencies in order to explore and understand the natural surroundings in a scientific manner. Science is needed in everyday life to meet human needs through solving identifiable problems.

Teachers have an important role in science learning, which is helping students become independent learners. So that they can present contextual problems, propose problems, think critically and solve these problems independently. But in fact the teachers in the schools of science in elementary school still use conventional learning models.

One of the mindset is the strengthening of critical thinking learning. The teacher teaches students' critical thinking skills, because students will not be able to save knowledge in memory for future use (Wilson in Muhfahroyin, 2009). Critical thinking is a way of thinking that is reasonable or based on reason to determine what will be done and believed. Meanwhile, according to Halpern (2008), critical thinking is one of cognitive skills and strategies that improve the expected outcomes of goals, thinking and oriented to the goal. Memorizing is no longer a surefire way to make students get good learning outcomes.

Based on the results of the International Program for International Student Assessment (PISA) in 2015, the capacity of the Sciences showed that the average science score was 403, placing Indonesia ranked 63rd out of 72 countries participate in the test. Most of the Indonesian students only mastered the lesson up to level three (C3), while students from other countries can master the lessons up to level four (C4), level five (C5) and level six (C6). The results of the survey can be concluded that students' critical thinking skills in Indonesia are still low.

Based on the initial reflection through the observation that students' critical thinking skills are not optimal because the inquiry-based activities are only on certain topics, the reason stated by the teacher is limited time and too many students. These conditions make students difficult to develop logical thinking with their own thinking skills and critical thinking skills.

The data is supported by the acquisition of test results distributed on the contents of science lessons in fourth class. The result is that from 36 fourth grade students only 11 students can answer the questions completely.

Based on the discussion of researchers with collaborators to solve these learning problems, researchers set alternative actions to improve the quality of learning using Inquiry learning models.

Inquiry learning model is one of the models developed with the aim to teach students how to think. Inquiry aims to help students develop contextual knowledge and high-level thinking skills (Arends, 2012). Inquiry learning models emphasize the ability to process information from individuals and systems that can be taught to improve abilities. With the information process, it is given a way for students to process stimulants from the environment, organize data, be sensitive to problems, generalize concepts and solve problems both verbally and non-verbally (Joyce and Weil, 1972). Thus students are expected to be guided to think critically in the investigation and develop the logic of finding their own knowledge.

This study aims to improve primary students' critical thinking skill through inquiry learning model in science learning.

2. Methodology

The type of research used is classroom action research conducted in two cycles, each cycle two sessions. Procedures used according to Arikunto (2013) are: (1) planning; (2) actions; (3) observation; (4) reflection. Research subjects were teacher and 36 fourth grade students. The variables of this study are critical thinking skills of fourth grade students of Elementary School through the inquiry learning model, teacher skills in the science through the inquiry learning model, and student activities in the science through the inquiry learning model. Data sources in this research were teachers, students and document data.

The type of data used in this study is quantitative data and qualitative data. Quantitative data in the form of critical thinking skills of students of science through the inquiry learning model obtained through test techniques. While qualitative data was collected using non-test techniques. Tests in research are written tests that are used to measure students' thinking skills. While the non-test technique used in this study is observation. Tests given to students were previously tested for validation questions through the Empirical Validity Test. Data analysis techniques to

calculate the completeness of classical learning outcomes and presentation in percentage form are:

$$S = \frac{\sum \text{complete student learn}}{\sum \text{student}} \times 100\%$$

(Aqib, et al.: 2011)

The content of the science through the Inquiry learning model can improve the critical thinking skills of the science of the students fourth grade in Elementary School with the following indicators of success:

- 2.1 Critical thinking skills of students in the sciencethrough the Inquiry learning model improves with learning completeness ≥ 77 and classical learning completeness $\geq 75\%$.
- 2.2 Teacher skills in the sciencethrough the Inquiry learning model can improve with criteria at least excellent ($27 \leq \text{score} < 36$).
- 2.3 Student activity in the science content through the Inquiry learning model can improve with criteria at least
- 2.4 excellent ($74.75 \leq \text{score} < 100$)

3. Result and Discussion

Based on observational data on the science through the Inquiry learning model is explained as follows:

3.1 Critical thinking skills

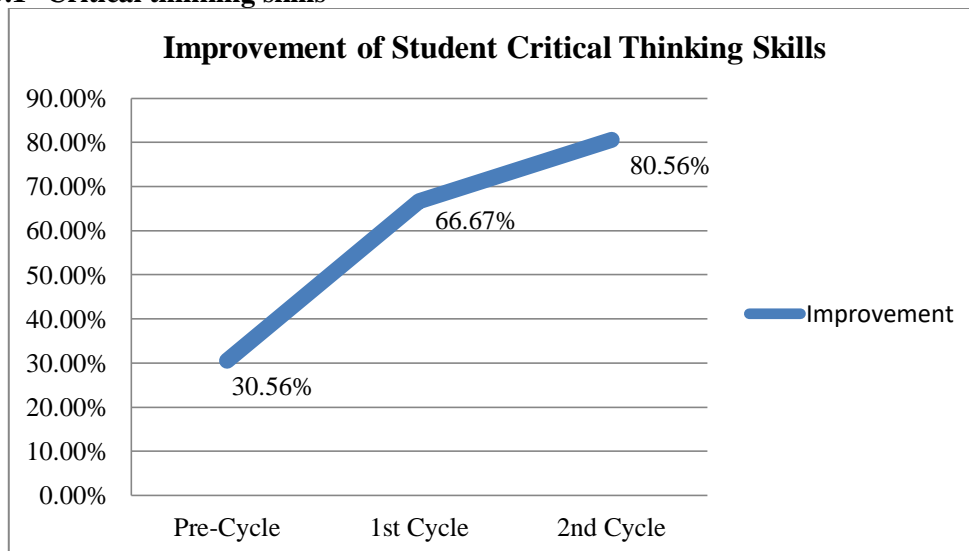


Figure 1.Improvement of critical thinking skills of students in Pre-Cycle, 1st Cycle and 2nd Cycle

Critical thinking skills of students in each cycle have improved. From pre-cycle to 1st cycle, it improved by 36.11%. In the second cycle there was a percentage increase of 13.89%. This shows that after applying the Inquiry learning model to the science, students' critical thinking skills are improved.

3.2 Teacher skills

Table 1. Average Improvement of Teacher Skills in 1st Cycle and 2nd Cycle

No	Teacher Skills Indicators	Score	
		1 st Cycle	2 nd Cycle
1	Convey learning objectives	4	4
2	Conveying questions that can provoke students' knowledge and curiosity	4	4
3	The process of solving problems and solving questions	3	3
4	Provide feedback on students' answers to questions related to the material or problems to be resolved	3	4
5	Guiding students when sharing discussion groups	3	4
6	Guiding students in discussion activities	2,5	4
7	Guiding every student who does not understand the material discussed	1,5	3,5
8	Provide confirmation and reinforcement of the results of the conclusions submitted by students	2,5	3,5
9	Reflect on the learning process	2,5	4
Total scores obtained		26	34
Percentage (%)		72,22%	94,44%

Based on Table 1, average teacher skills showed improve from 1st cycle to 2nd cycle, up 22.22%. The skills of teachers in the 1st cycle are in the good category and in the second cycle are excellent categories. Teacher skills are in accordance with the steps of learning through the inquiry learning model

Learning is a complex process and involves various interrelated aspects. Therefore, to create creative and fun learning requires a variety of skills.

3.3 Student activity

Table 2. Average Improvement of Student Activity in 1st Cycle and 2nd Cycle

No	Student Activity Indicators	Score	
		1 st Cycle	2 nd Cycle
1	Prepare yourself for learning (emotional activities)	15	19
2	Active in group learning activities (oral activities, motor activities)	13	17,5
3	Analyze and present problems found (oral activities, writing activities)	14	18,5
4	Delivering group work results (oral activities, mental activities)	14	18
5	Delivering group work results (oral activities, mental activities)	13	18
Total scores obtained		69	91
Percentage (%)		69%	91%

Student activity from each cycle has improved. The improvement in each cycle in the 1st cycle in the 2nd cycle experienced an improve of 22%. While the activities of students in the 1st cycle entered in the good category and in the 2nd cycle entered in the excellent category.

Effective teachers need to understand students' growth and development comprehensively (Hamalik, 2011). This understanding will make it easier for teachers to assess student needs and plan goals, materials, teaching and learning procedures appropriately. Student activity is not enough to just listen and record. Diedrich in Sardiman (2011) made a list containing student activities which could be classified as follows: visual activities, oral activities, listening activities, writing activities, motor activities, mental activities, emotional activities.

According to Djamarah (2010), teaching and learning process can be successful, if each teacher has their own views in line with his philosophy. Another view of the relevant inquiry learning model with a systematic description of the results of research conducted by previous researchers in accordance with the substance under study. Research that is considered relevant to this study, among others:

Student learning outcomes during the learning in the first cycle obtained a percentage of 81.82% and in the second cycle became 88.64% seen to have increased by 6.82%. While the results of the observation sheet assessment of students' critical thinking skills increased with clarifying aspects of obtaining a percentage of 70.02%, observing obtaining a percentage of 75%, minimizing errors in obtaining a percentage of 58.52% and concluding a percentage of 59.09%.

4. Conclusion

Based on the research that has been done, it is proven that there is an improvement in students' critical thinking skills, teacher skills and student activities of science in the fourth grade of the State Elementary School. This proves that the application of the Inquiry learning model is an alternative method to improve the critical thinking skills of students of science in elementary school.

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