

Using Predict-Observe-Explain learning model to improve critical thinking ability of 4th grade students on science material

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Abstract

The problem that becomes the focus in this classroom action research is the low critical thinking skills of students in grade IV A. This study aims to determine the increase in students' critical thinking skills using the POE (Predict Observe Explain) learning model. This research includes classroom action research (PTK) using collaborative methods between researchers and teachers. This study consisted of 2 cycles, each cycle consisting of 2 meetings. This research was conducted at SD Muhammadiyah Ambarketawang 3, in grade IV A students, which amounted to 5, consisting of 2 boys and 3 girls. Data collection techniques used observation sheets and documentation. The results of the increase in critical thinking skills showed that in the first cycle of learning I to improve critical thinking skills there were 2 students achieving critical thinking skills achievement scores, namely 60% with a score of 60% and 90%. Whereas in the second cycle the increase in critical thinking skills, there were 4 students who completed their critical thinking skills, namely getting a score of 70% to 100%. Based on the results of this analysis, it can be concluded that the application of the POE learning model can improve the critical thinking skills of class IV A students in science material.

Keywords: critical thinking skills, Predict-Observe-Explain, science material

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INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual, religious, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state. Ki Hajar Dewantara said education is a conscious human effort to improve character, through schools so that children can become better and more perfect, so that students can be more advanced and balanced physically and mentally (Ruminiati, 2014).

Based on observation in SD Muhammadiyah Ambarketawang 3 the process of delivering material in science learning, the teacher still acts as the center of learning in the classroom (teacher-centered). Students in the class feel bored and less active. The science learning process is only delivered through books without any proof process. This causes the students' critical thinking skills to be low. Therefore, it is necessary to make changes in the learning process, including changes in teaching strategies and methods. Teachers must have learning model solutions so that students' critical thinking skills can be improved. So we need a learning model that can improve critical thinking skills. One of the learning models that can empower critical thinking skills is the POE (Predict Observe Explain) type of cooperative learning model.

The POE (Predict-Observe-Explain) type of cooperative learning model can be used by teachers to provide an in-depth understanding of learning design activities and strategies that start learning from the point of view of students not from the teacher. The syntax of the POE type of cooperative learning model is Predict, Observe, and Explain. POE learning technique is suitable to be applied to grades IV and above because if it is applied to grades IV and below, students will have difficulty writing down observations, let alone explaining theoretically. However, the POE

learning technique is not suitable to be applied to all materials. Materials that are not hands-on are difficult or unable to use this technique. This technique is suitable for use in science subjects because it prioritizes students experiencing the process directly, developing scientific attitudes and process skills. With the POE learning technique, students train students in making predictions of what can happen, make observations, collect and register a number of data, draw conclusions and discuss with their groups. So, with this technique can strengthen the mastery of concepts in students. Many studies have proven the effect of POE in learning process such as studies by Tlala (2011), Teerasong, et al. (2010), as well as Adebayo and Olufunke (2015).

Limitation of problems is students' low critical thinking skills can be improved through the application of the POE learning model. Purpose of the research to improve students' critical thinking skills on science material by using the POE learning model at SD Muhammadiyah Ambarketawang 3.

RESEARCH METHOD

This type of research uses Classroom Action Research in a collaborative manner, namely the researcher collaborates with the teachers of Grade IV A at SD Muhammadiyah Ambarketawang 3. This research was conducted in Grade IV A SD Muhammadiyah Ambarketawang 3 in Gamping, Sleman, Yogyakarta Special Region. The research time is carried out for 1 month from November to December 2020. The research subjects were teachers and students of Grade IV A SD Muhammadiyah Ambarketawang 3 with a total of 5 students, consisting of 2 male students and 3 female students. The design in this study the researchers used the Kemmis and Mc Taggart model (1988) (Arikunto, 2012:132).

This model can be seen through the following picture consisting of planning, implementation, observation, and reflection. Techniques in this research observation of the implementation of the POE learning model. Instruments of the data collection is critical thinking ability observation sheet and POE implementation observation sheet. Observation assessment is carried out classically, namely by using the student's critical thinking ability observation sheet, in which the Yes answer has a value of 60% of all statements in the critical thinking ability observation sheet. Find the average score obtained by students in each item. The maximum score for all students in 1 item is 10% and the highest is 100%. Improving critical thinking skills using the POE learning model is said to be successful if the overall score for each item is 60%.

RESULTS AND DISCUSSION

The initial data that the researcher considers as an initial guideline for conducting this research is the pre-cycle observation sheet. This data will be used as an initial benchmark before conducting the research. According to the criteria, students are considered to have good critical thinking skills if the percentage value of the observation sheet reaches a minimum of 60%. Based on observations, it can be seen that indeed the five students do not have good critical thinking skills, and can be seen from Table 1.

Table 1. Pre-cycle data

No.	Students	Percentage of Critical Thinking Ability	Category
1.	ARF	20%	Incomplete
2.	KA	20%	Incomplete
3.	NR	20%	Incomplete
4.	NZN	10%	Incomplete
5.	RFC	50%	Incomplete

In the learning implementation, namely in Cycle I and Cycle II, the teacher used the POE learning model and it went well. To see the implementation of learning using the POE learning model in Cycle I and Cycle II which went well, it can be seen in Table 2 and Table 3.

Table 2. Implementation of POE learning model in Cycle I

Cycle I	Value of POE Model Implementation	Category
Learning I	90	Implemented
Learning II	100	Implemented

Table 3. Implementation of POE learning model in Cycle II

Cycle II	Value of POE Model Implementation	Category
Learning I	100	Implemented
Learning II	100	Implemented

As shown in Table 2 and Table 3 above, in the first cycle of Learning I, the value of the implementation of the POE learning model is 90. While in the Learning II, the value of the implementation of the POE learning model reaches 100. From these two values, it can be interpreted that the implementation of the POE learning model is running well. While in Cycle II, the value of the implementation of the POE learning model in Learning I and II has reached 100. From these two values, it can be interpreted that the implementation of the POE learning model is going very well. So, it can be concluded that the POE learning model in Cycle I and Cycle II was carried out well.

In Cycle I, the first meeting was the provision of a stimulus using the POE learning model. Meanwhile, at the second meeting, the researcher made observations using the observation sheet to see the increase in the critical thinking ability of each student. Observations were carried out using a prepared critical thinking ability observation sheet. From the observations carried out in Cycle I, obtained data as listed in Table 4, as well as a comparison of critical thinking skills which can be seen in Table 4. In Table 4, it is found that there are 2 students who have completed or have a score of at least 60% of all evaluations. Thus, as can be seen in Table 4, that through the first cycle there was an increase in critical thinking from the pre-cycle assessment.

Table 4. The improvement of critical thinking ability

No	Students	Value of Critical Thinking Ability			Category
		Pre-Cycle	Cycle I	Cycle II	
1.	ARF	20%	60%	90%	Complete
2.	KA	20%	30%	70%	Complete
3.	NR	20%	30%	40%	Incomplete
4.	NZN	10%	20%	70%	Complete
5.	RFC	50%	90%	100%	Complete

In Cycle I of Learning I, the critical thinking ability of students after the implementation of the POE learning model has increased. This can be seen from the students achieving a critical thinking ability achievement score of 60%. In Cycle I, there were two students who completed their critical thinking skills, namely those who scored 60% and 90%. Researchers feel that the increase in critical thinking skills in students is still not optimal, so Cycle II is carried out. In cycle II, students' critical thinking skills after the implementation of the POE learning model increased.

It can be seen from the students who achieved a score of 60% of critical thinking skills. In Cycle II, there were four students who completed their critical thinking skills, which scored 70% to 100%. In the prediction stage of the POE learning model, students begin to show their critical thinking which is indicated by being able to predict the material to be studied. At the observation stage, students are able to observe and conclude the material they are studying. While at the explain stage, students are able to give opinions and even refute or strengthen their friends' opinions to conclude the material being studied. Researchers feel that the increase in students' critical thinking skills has been maximized so that the research is completed until Cycle II. This is also in accordance to Kearney and Young (2007) that the POE strategy can help students to understand the concept through direct observation and observation activity is an explanation or an answer to the problem.

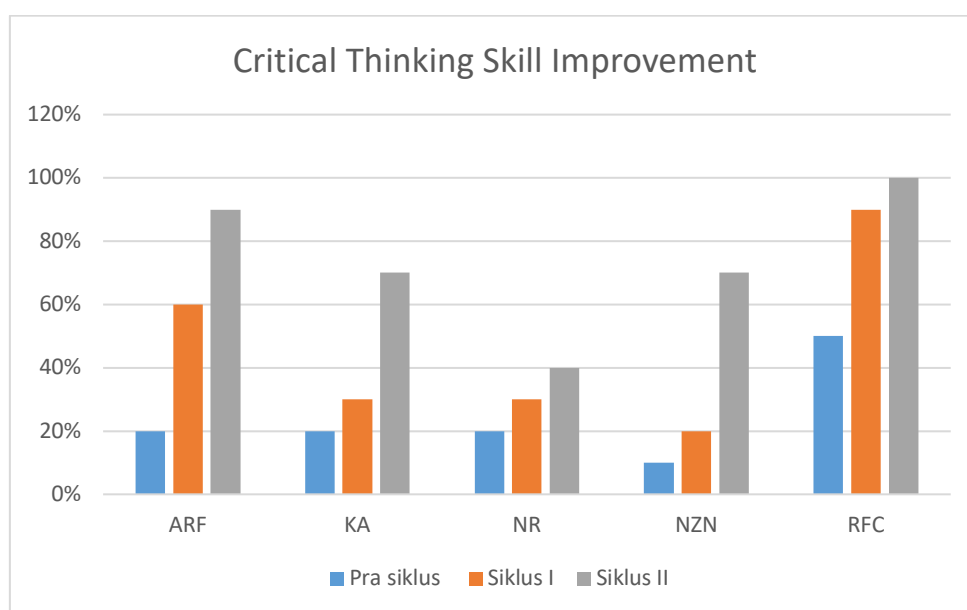


Figure 2. Diagram of critical thinking skill improvement

Based on the research results, the POE learning model can improve students' critical thinking skills. This is also reinforced by research conducted by Yulianto (2014). The result from the research Lee and Kim (2015) science research ability was improved as POE science class encouraged the research activities of students

CONCLUSION

The success in implementing the POE learning model can be seen from the actions taken in cycle I and cycle II, which show an increase in students' critical thinking skills. The results of increasing critical thinking skills show that in Cycle I Learning I, in terms of increasing critical thinking skills, there are two students who achieve a score of 60% critical thinking skills, with 60% and 90% scores. While in Cycle II, in terms of increasing critical thinking skills, there are four students who complete the achievement of critical thinking skills, namely getting a score of 70% to 100%. Based on the results of the analysis, it can be concluded that the application of the POE learning model can improve the critical thinking skills of Grade IV A students on science material.

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