Implementation of Predict Observe Explain Model and Outdoor Guided Inquiry in Improving Students' Critical Thinking in Science Learning

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Article Info

Abstract

This study aims to analyze the implementation of Predict Observe Explain (POE) learning models for increasing critical thinking skills of fifth grade elementary school students, analyze the Implementation of Outdoor Guided Inquiry learning models in increasing critical thinking skills of fifth grade elementary school students, comparing the effectiveness of POE learning model and Outdoor Guided Inquiry in the critical thinking ability of fifth grade elementary school students. This research used a quasi-experiment with pre-test and post-test control group design. The population and sample taken in this study were all fifth-grade students of SD Negeri 1 Sambong (eksperimen group) and SD Negeri 3 Sambong (control group), totaling 42 students. The experimental group was intervened by Outdoor Guided Inquiry while the control group by Predict Observe Explain. In this study data were taken using test instrument and questionners. Data analysis techniques used in this study were independent samples t-test, and classical completeness test and N-gain test. N-gain calculation results show that the average in the OGI class is 0.61, and the POE class is 0.38, which means that the Outdoor Guided Inquiry model is better in improving students' critical thinking abilitis compared to the Predict Observe Explain model. Based on the t-test calculation of OGY and POE classes, t_{table} = 2.021 and t_{value} = 4.265, so $t_{value} > t_{table}$ shows that the OGI learning model is significantly better than the POE model.

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INTRODUCTION

Curriculum 2013 emphasized the importance of 21st-century learning skills to respond to the demands of an increasingly competitive era. In the 21st-century learning, there are four categories (The 4Cs), namely Communication, Collaboration, Critical Thinking, and Problem Solving, Creativity and Innovation which very important to be trained to students. As said by Soh *et al.,* (2010) the 21st-century skills such as critical thinking and problem-solving, communication, collaboration, creativity, and innovation are essential to be integrated into the education system as has been applied in western countries, which led them to become a great countries.

Hyytinen *et al.* (2018) states that critical thinking purpose students learn effectively and refers to the thought of self-discipline, where students assess, evaluate, synthesize, and interpret relevant information related to a situation. The ability to think critically is one crucial component that is expected to emerge as a result of learning activities. The ability to think critically will arise when students are confronted with a problem. The fact is that the learning process that has been carried out is teacher centered and uses a direct learning model that is a learning model that does not require students to obtain their knowledge, students are immediately given material, concepts, formulas, without having to know and find their origin.

Improving students' critical thinking skills is a goal in the quality of learning. As said by Susanto (2013), critical thinking is a thinking process that needs to be developed to solve problems, form conclusions, gather possibilities, and make decisions when using all of these skills effectively in the right context and type. Learning model that can support critical thinking abilities is the Predict Observe Explain (POE) learning model, and Outdoor Guided Inquiry (OGI).

In addition to the POE model that is suitable for improving critical thinking are the Outdoor Guided Inquiry model according to Bilgin (2009) Guided inquiry activities help students to develop their responsibilities,

cognitive methods, report making, problem solving and understanding skills. According to Maretasari *et al.* (2012) one of the learning models that can be selected by teachers to increase student participation in the learning process is a guided inquiry learning model. As stated by Salu (2019) guided inquiry could improve science learning.

Based on preliminary studies at SDN 1 Sambong, in teaching-learning process, the use of lecture and group discussion methods are following the teacher's book and student's book. Within 2x35 minutes, the teacher delivered the material for the remaining 40 minutes for 30 minutes; the students were given the evaluation questions. During the learning process, students listen and work on problems, but students have not been allowed to develop critical thinking. Also, based on the results of observations with the observation sheet critical thinking skills of fifth-grade students showed 59.2% of students were lacking, 33.3% of students were sufficient, and 7.4% of students were good at critical thinking during learning. The learning outcomes reflect the students' lack of thinking ability in the learning process.

This research aims to find out implementation Outdoor Guided Inquiry model and Predict Observe Explain in improving students critical thinking of primary school.

METHODS

This research is a quasi-experimental study. The quasi-experimental research design of this research is pre-test and post-test control group design. Involves two classes, namely the POE class and OGI class. The experimental class is the class that gets the new treatment being investigated, while the control class is a class that receives a different treatment or as usual. Both classes before receiving treatment are a balanced class or almost balanced. The study was conducted at SDN 1 Sambong and SDN 3 Sambong. The research subject is class V. The independent variable in this study is the Predict Observe Explain (POE) learning model and Outdoor Guided Inquiry Model. X1 is the Predict

Observe-Explain (POE) learning model, and X2 is the Outdoor Guided Inquiry Model. The dependent variable (Y) in this study is the ability to think critically.

Data collection methods in this study were carried out by the method of documentation, observation, questionnaires, and tests. Based on the results of the test analysis of the test instruments which include validity, reliability, level of difficulty, and the different power of the questions obtained items that are worthy of being used as a matter of evaluation tests to measure critical thinking abilities.

RESULTS AND DISCUSSION

The research began with the provision of pre-test questions at SDN 1 Sambong, and SDN 3 Sambong. Then learning is done with the OGI learning model for SDN 1 Sambong, the POE model for SDN 3 Sambong. After that, student is given a post-test. The recapitulation of the pre-test and post-test values in Figure 1.
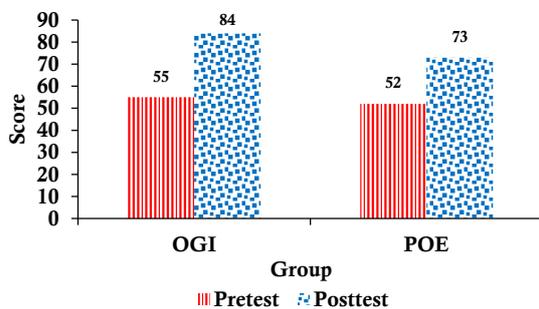

Figure 1. Average Pre-test And Post-test Scores

The previous result pretest score for both groups were relatively similar. After treatment, the OGI class and POE class both improved, but the results of the posttest score in the OGI class showed higher results than the POE class. The results of the post-test pre-test scores of the OGI experimental class students with 20 student the average pre-test value 55 and the average post-test value 84, for the POE class with the number of students 22 children the average pre-test value 52.

Based on the results of the initial stage of the analysis, it was obtained data that showed that the samples in the study were normally distributed, had a homogeneous variance, and in the two classes of samples there was no average difference. This means that the sample comes from the same condition.

Final data on the value of critical thinking skills of the two classes used in the study are presented in Table 2.

Table 2. Test Results of Differences in Average Post-test Values

Learning outcomes	f	Sig.	T	df	Sig. (2-tailed)
Equal variances assumed	.024	.876	4.265	40	.000

The results of the calculation of the two samples, from the list of distribution of t with dk = 20 + 22-2 = 40 and $\alpha = 0.05$, obtained $t_{table} = 2.021$ and $t_{value} = 4.265$. So $t_{value} > t_{table} = 4.265 > 2.021$ and the significant value in the significant column in the Sig (2-tailed) column is $0.000 < sig$ value 0.05 (5%). Based on the analysis of the data above, it can be concluded that H_0 is rejected and H_a is accepted, meaning that there is a difference between the Outdoor Guided Inquiry experimental class and the Predict Observe Explain experimental class.

After testing the difference in average, then the effectiveness of the Outdoor guided inquiry and Predict observe explain models on the students' critical thinking skills can be seen in Table 3.

Table 3. Model Effectiveness Test Results

Classical completeness test (%)		Test N-gain (%)	
OGI	POE	OGI	POE
95	50	61.2	38.1

Based on Table 3, the results of the effectiveness of the Outdoor Guided Inquiry model, it obtained a 61.27 N-gain test, meaning that the model used was effective in increasing critical thinking skills. As for the experimental class with the Predict Observe Explain model, the test obtained was 38.14, meaning that the model used was quite effective in increasing students' critical thinking abilities.

Based on the calculation of the N-gain test, it can be concluded that the Outdoor Guided

Inquiry model is more effective in increasing students' critical thinking skills compared to the Predict Observe Explain model and the model in the control class. More details can be seen in Figure 2 a comparison of students' critical thinking abilities based on post-test scores.
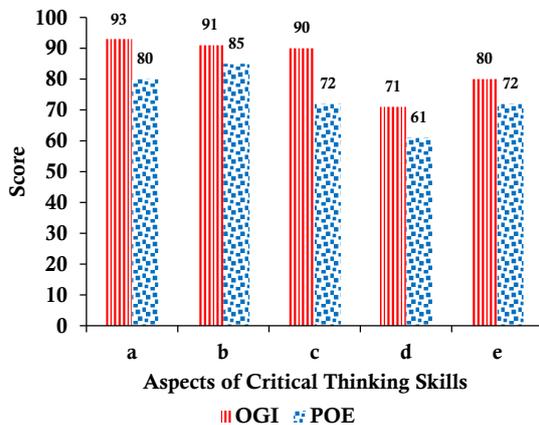

Figure 2. Comparison of Critical Thinking Abilities

Aspects of critical thinking skills (a) Provide simple explanations (b) Build basic skills (c) Conclude (d) Provide further explanations (e) Manage strategies and tactics. Figure 3 and 4 show the result of student critical thinking ability test.
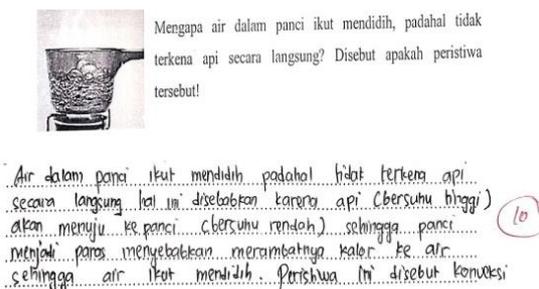

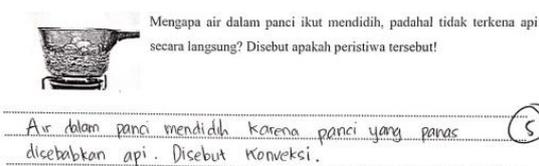**Figure 3**. OGI class

Figure 4. POE class

Figure 3 and 4 show aspects of critical thinking skills about provide further explanations. Both answers have differences in

analyzing the questions, in explaining the OGI group students' problems in more detail and clarity while in the POE class students only analyze the problem briefly.

Learning in experimental class using Outdoor Guided Inquiry model is done by dividing students into several groups of 4-5 people and observing/experimenting outside the classroom. Before doing learning outside the classroom, educators explain the material and problems that must be solved by students. Then students do learning outside the classroom. Science learning by using the OGI model, can foster the active participation of students during learning. As said by Brickman *et al.,* (2009) during the inquiry process in making questions and seeking answers, are involved in planning, reflecting, and evaluating then the inquiry process helps develop students' thinking processes between Another critical thinking. According to Praptiwi *et al.* (2012) the application of guided inquiry learning models can increase student enthusiasm in the implementation of learning activities and students become the focus in implementing learning so that students' critical thinking ability increase.

Thinking with the inquiry approach in teacher learning is not just about giving knowledge to students. Students must build their knowledge in their minds. Wahyudin. *et al.* (2010). Learners become more enthusiastic in the learning process. Besides activities outside the classroom can make the learning atmosphere more enjoyable for students and active during the learning process.

The results of this study indicate that the delivery of heat material and its transfer to the OGI model is more effective in improving students' critical thinking skills compared to the POE and conventional models. This is inseparable from the use of the OGI model to further enhance the activeness of students in group observation/experiment activities, so they can find knowledge together, be able to solve problems, improve understanding and develop students' thinking. As said by Uswatun *et al.,* (2015), inquiry-based science learning is effectively used in the learning process to improve

students' critical thinking skills and scientific attitude.

In contrast to OGI class using the POE model. Educators provide a problem to be solved by students. According to Syamsiaya *et al.,* (2018) Predict Observe Explain Model is very useful in diagnosing students in scientific understanding. In the experiment activities, each student is actively involved in it. Student's duty to present their work in front of their peers to report their findings which also match the results of experiments/observations with previous predictions. Students can explain observations/experiments well without being appointed by the teacher.

Learning with the Predict Observe Explain model is different from learning with the Outdoor Guided Inquiry model, it is more effective to use the OGI model. Because based on the test gain for OGI of 0.61 while for POE of 0.38. Besides OGI learning teaches students to learn with a new atmosphere, and make observations and experiments outside the classroom, so students get experiences, and impressions that are fun and more active during the learning process.

However in this research, it proved that Outdoor Guided Inquiry was different compare to Predict Observe Explain. Both models could improve critical thinking abilities but OGI was better than POE.

CONCLUSION

Based on the results of the analysis and discussion, it can be concluded that Outdoor Guided Inquiry Learning model was effective in improving the ability of critical thinking.

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