

Influence of Assisted POE (Predict, Observe, Explain) Model Diorama on Students' Understanding of Science Concepts at SD Negeri Pringapus 01

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Abstrac: This research aims to determine the difference in the use of the POE (Predict, Observe, Explain) model assisted by dioramas on understanding concepts, to find out the effect of using the POE (Predict, Observe, Explain) model assisted by dioramas on understanding concepts. This research was conducted at SDN Pringapus 01. This research uses a quantitative approach with a quasi-experimental method. The sample determination in this research was purposive sampling. The population in this study were students at SDN Pringapus 01. The samples taken in this study were class IV at SDN Pringapus 01. Where class IV A was the experimental class and class IV B was the control class. With data collection techniques using science description question sheets, observation sheets and questionnaires. The data analysis techniques used are normality tests, homogeneity tests and hypothesis tests in the form of paired sample t-tests and simple linear regression tests. The research results show (1) there is an influence of using the POE (Predict, Observe, Explain) model assisted by dioramas on increasing understanding of concepts. This is proven by a significant value of $0.000 < 0.05$. (2) There is a significant difference between learning using the POE (Predict, Observe, Explain) model assisted by dioramas towards understanding science concepts. This is also proven by the significance results of $0.000 < 0.05$. The conclusion from this research is that the POE (Predict, Observe, Explain) model assisted by dioramas has an influence in increasing students' understanding of science concepts.

Keyword: POE (Predict, Observe, Explain); Dioramas; Concept understanding

INTRODUCTION

Natural Sciences (Science) is an important field of study that needs to be instilled in students because natural science learning is able to make students behave scientifically in solving problems (Rusnadi, 2013). Science lessons play an important role in human development. That science lessons are not just about memorizing facts but also about understanding basic concepts and developing critical thinking skills that can be applied in life. Understanding concepts is indeed a key factor that influences student learning outcomes. The ability to understand concepts, situations, and facts in depth allows

students to integrate new information with the knowledge they already have. The science (Natural Science) learning approach in elementary schools which emphasizes providing direct experience to students and encouraging their active participation really supports the development of conceptual understanding and skills in scientific thinking. Understanding concepts at the elementary school level is very important because it is the basis for understanding more complex concepts at the next level of education, including at university. Students are said to understand the concept of a lesson if they are able to explain a concept/knowledge from the material that has been given using their own words and are able to draw conclusions from the material. Because students can understand the learning concepts taught well, and master it, student learning outcomes will definitely be good.

Based on observations and preliminary studies during internship 2 regarding students' conceptual understanding abilities, it was found that students' conceptual understanding was still low. The learning process at SDN Pringapus 01 does not emphasize students' ability to understand concepts. In the learning activities the teacher uses conventional methods and teaches without using media during the learning process, therefore teaching and learning activities are meaningless. It can be seen that students are less active, teachers only focus on the material without involving students in the learning process, students play alone and there are some students who just sit silently during teaching and learning activities. This is reinforced by the work of students who are asked to complete conceptual understanding questions such as the following.

Table 1. Results of Pre-research Concept Understanding

No	Indicator	Class IV A	Class IV B	Average/%
1.	Interpret	40%	52,38%	46,19%
2.	Example	36%	47,61%	41,8%
3.	Grouping	38%	50%	44%
4.	Drawing Inferences	34%	42,85%	38,42%
5.	Compare	40%	54,76%	47,38%
6.	Explain	42%	50%	46%
7.	Summarizing	36%	57,14%	46,57%
Average		38%	50,67%	44,33%

Based on the results of students' problem work, above, the percentage of indicators for understanding students' concepts is obtained, the accuracy of the answers to each indicator is 46.19% for interpreting indicators, 41.8% for exemplifying indicators, 44% for grouping indicators, 38.42% for drawing inference indicators, 38.42% for comparing

indicators. 47.38%, indicators explaining 46% and indicators summarizing 46.57%. Based on this percentage, the indicator that draws inference is the indicator with the lowest value. So in connection with the low understanding of students' concepts, increasing students' conceptual understanding is a task that needs to be carried out by teachers. Questionnaire data on the learning process of class IV students at SD N Pringapus 01. The questionnaire contains statements regarding indicators of understanding concepts, learning models and media used by teachers in the learning process. Following are the results of the questionnaire for class IV students at SD N Pringapus 01, the following data were obtained:

Table 2. Learning Process Questionnaire Data

Class IV	INDICATOR			Total
	Pemahaman konsep	Model pembelajaran	Media Pembelajaran	
Class IV A	26,5%	17%	20%	63,5%
Class IV B	32,2%	20,6%	15,8%	68,6%
Total	58,7%	37,6%	35,8%	132,1%
Average	29,35%	18,8%	17,9%	44,0%

Based on the results of the data above, it is known that the average percentage of statements understanding concepts in class IV A is 26.5%, learning models are 17% and learning media are 20%. Meanwhile, for class IV B students, the concept understanding statement was 32.2%, 20.6% for learning models and 15.8% for learning media. Referring to the problems that have been explained, a learning process is needed that can improve students' ability to understand concepts. One way is to involve learning models that can trigger students' interest, enthusiasm and active involvement in the learning process. One of several learning models that can be applied according to this goal is the POE (Predict, Observe, Explain) learning model. According to Mahardewi, Yupani and Garminah (in Izza, 2017: 82) the POE (Predict, Observe, Explain) model has the following advantages: (1) It can show more student creativity when submitting predictions. (2) Can stimulate students' curiosity when carrying out observations/experiments and proving the results. (3) When conducting experiments to test predictions, it can reduce the tendency to verbalism. (4) The implementation of teaching and learning activities becomes better and more interesting, because students are not only listeners but also carry out the steps of the POE learning model. (5) By making direct observations students can compare their

predictions with the results of observations made so that students will become more confident in the truth of the material.

Based on the results of observations or observations of teachers in class IV of SD Negeri Pringapus in teaching and learning activities, teachers have not implemented or utilized learning models. appropriate and appropriate to learning, teachers use conventional teaching methods or lecture approaches in the learning process, where this method is only teacher-centred and has limited use of learning media as a support in the teaching and learning process. This is reinforced by the results of pre-research which show that the level of student understanding of concepts is still low, namely 44.33%. In connection with students' low understanding of concepts, efforts are needed by teachers to increase understanding of these concepts.

According to Suparno (2013:112-113), learning with the POE model uses three main steps, namely (1) prediction, namely making guesses about an event, (2) observation, namely making observations, (3) explaining (explanation), namely providing an explanation of the results of predictions and observations. In this way students not only receive information but are also actively involved in forming their understanding of learning concepts. First, in the prediction stage, students make guesses about a problem, then students observe whether the initial guess made is right or wrong, then after students know the results, students look for an explanation of the results. By implementing this POE learning model, students are guided and asked to identify knowledge concepts through their own observations.

Apart from models, media can also increase students' understanding of concepts. A medium that can be utilized is using dioramas. Using media will become the center of student interest as long as the teacher provides explanations about the learning material so that students will understand the learning (Alfi Nurul Hidayati, et al., 2017). Diorama is a three-dimensional media that contains images or objects that represent actual views (Nana Sudjana, et al., 2016). In making diorama media, it must be made with attractive colors, real objects so that students are interested and easy to understand what is displayed. By using this media students will be enthusiastic and interested in learning science so that the connection between students' understanding will emerge.

Using the POE learning model with the help of dioramas will make it easier for students to understand the material so that learning objectives will be achieved, students

will obtain maximum learning results and apart from that students can also be motivated to actively participate in learning. So it has an effect on increasing students' ability to understand concepts and student learning outcomes.

METHOD

The approach applied is quantitative and the research methodology used is experimental. The population consisted of class IV students at SDN Pringapus 01. The sample from this research was class IV students at SDN Pringapus 01 which consisted of 25 students in class IVA and 21 students in class IVB. The sampling technique used was purposive sampling by applying nonprobability sampling techniques. The data collection techniques in this research are 1) tests used to measure students' conceptual understanding of energy material. Testing was carried out twice, namely before applying the treatment (pretest) and after administering the treatment (posttest). 2) Observation is used to observe the learning process, whether the learning method being observed is appropriate or not and to ensure that students understand the learning material or not. 3) Questionnaires are used to measure student understanding after the learning process. Data analysis techniques involve statistical tests including normality tests, homogeneity tests and hypothesis tests. Hypothesis testing is also used to determine whether the hypothesis is accepted or rejected, researchers use two tests in this hypothesis testing process, namely the independent sample T Test and the simple linear regression test.

Table 3. Scoring Criteria for Understanding Science Concepts

Mark	Information
$81\% \leq x \leq 100\%$	Vary Good
$61\% \leq x < 80\%$	Good
$41\% \leq x < 60\%$	Fair

RESULTS

Table 2. Simple Linear Regression Test Results

		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	49.182	3.173		15.502	0.000
	Model POE diorama	0.635	0.068	0.890	9.339	0.000

These results have a significance value of $0.000 < 0.05$ as seen in table 4.2 above. From the results above, it can be seen that the understanding of science concepts for class IV A students using the POE (Predict, Observe, Explain) learning model assisted by diorama media has an effect on increasing understanding of science concepts by 79.1% in accordance with $R \text{ Square} = 0.791$ which is based on these results.

Table 4. Post-test Results Average Concept Understanding

Sub Indikator	Class IV A	Class IV B	Average
Interpret	88%	83,3%	85,65%
Give an example	81%	60,7%	70,85%
Grouping	76%	72,6%	74,3%
Drawing Inferences	58%	64,2%	61,1%
Compare	80%	60,7%	70,35%
Explain	78%	54,7%	66,35%
Summarizing	86%	54,7%	68,85%
Amount	547%	450,9%	497,42%
Average	78,14%	64,41%	71,06%

Number Based on the results of the data above, there is a difference in the average results between the control class and the experimental class. The experimental class (IVA) value is higher than the control class (IV B). The average result in the experimental class was 78.14%, which shows that students' understanding of concepts is good.

Table 5. Independent Sample T - test results

No	Class	t	df	Sig.	Mean	Lowest Score	The highest score
1.	Control Class	-4.654	44	0.000	68.33	45	80
2.	Experimental Class	-4.781	43.236	0.000	78.00	65	95

The results of the independent sample T-Test test data above show that learning involving the POE (Predict, Observe, Explain) model assisted by dioramas on students' understanding of science concepts in the experimental class is significantly different from learning using POE in the control class. In the experimental class the average results were higher compared to the control class, namely $78.00 > 68.33$. The results show that the average difference between the control class and the experimental class is 9.67, this shows that the application of POE learning in the experimental class which is assisted by diorama media in understanding science concepts is superior to the control class. This is also supported by the results of the independent sample t-test which shows significant results of $0.000 < 0.05$ for both the control class and the experimental class, this shows that there is a significant difference between POE (Predict, Observe, Explain) model

learning assisted by dioramas and POE model learning (Predict, Observe, Explain) in the control class. So, it can be concluded that the POE (Predict, Observe, Explain) learning model assisted by diorama media can improve students' understanding of science concepts.

DISCUSSION

Based on research findings, students' understanding of science concepts is influenced by the POE (Predict, Observe, Explain) model assisted by dioramas. From the simple linear regression test data, the POE (Predict, Observe, Explain) model assisted by dioramas is the independent variable and understanding of science concepts is considered the dependent variable. By implementing the POE model assisted by dioramas, it makes it easier for students to understand the science concepts presented better. Research by Novanto et al (2021), supports this conclusion by stating that the POE (Predict, Observe, Explain) model plays a role in increasing students' understanding of concepts. Apart from this, research by Nurliana et al (2019) also states that the application of the POE (Predict, Observe, Explain) model has an influence on students' understanding of science concepts based on the difference in pretest and posttest scores..

Based on research findings, it is known that students learn more effectively using the POE learning model assisted by diorama media to understand science concepts. The average score for the experimental class is higher than the control class, as seen in table 4.1. The POE (Predict, Observe, Explain) learning model increases students' understanding of science concepts, this is because the control class only applies the POE model while the experimental class applies the POE model assisted by diorama media.

CONCLUSION

The following is a summary of the analysis and review regarding the impact of using the POE (Predict, Observe, Explain) learning model assisted by dioramas on students' understanding of science concepts:

1. There is an influence of using the POE (Predict, Observe, Explain) model assisted by dioramas on understanding concepts, this is supported at a significance value of $0.000 < 0.05$. Thus, it can be concluded that the POE (Predict, Observe, Explain) learning model assisted by dioramas has an impact on the concept understanding

variable resulting in an increase in concept understanding of 79.1% in accordance with R Square = 0.791.

2. There is a significant difference between learning using the POE (Predict, Observe, Explain) model assisted by dioramas and understanding of science concepts. This is supported by a significance result of $0.000 < 0.05$. Thus, it can be concluded that there is a significant difference between the experimental class and the control class. This is supported by the average results obtained by students in the experimental class which were higher than the control class, namely $78.00 > 68.33$.

The suggestions that researchers can convey are: (1) The use of the POE model can be combined with other media which can increase student participation and motivation in learning. (2) Other researchers who will use diorama media to develop research on the POE (Predict, Observe, Explain) learning model must ensure readiness in research so that the research runs smoothly and meets its objectives.

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