Implementation of POE Learning Model with Worksheets Assistance to Improve Students' Activities and Learning Outcomes

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Abstract
The purpose of this study is to improve the students' activity and learning outcomes through the implementation of the POE learning model with the assistance of student worksheets. The research subjects were 22 students' grade of VIII SMP Negeri 4 Batukliang Utara. This type of research is classroom action research (CAR), which is carried out in two cycles. Each cycle consists of four stages, namely planning, implementation, observation/evaluation, and reflection. The implementation of the POE learning model is carried out through three stages, namely Predict, Observe, and Explain stages. The measured variable is the activity and learning outcomes on the subject matter of Motion. Research data collection techniques using observation sheets and tests. The results of the study in Cycle I obtained an average score of student learning activities is 2.08 with the category of quite active and the average value of students' learning outcomes is 73.41 with classical completeness of 54.55%. In cycle II the average score of students' learning activities is 2.95 with the actively category and the average learning outcome is 83.41 with a classical completeness of 86.36%. Based on the results of the study it was found that the implementation of the POE learning model with the worksheets assistance could improve the students' activities and learning outcomes grade of VIII SMPN 4 Batukliang Utara.

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INTRODUCTION

Education is part of the process of state life. The quality of a country can be seen from the quality of Human Resources (HR) owned by the State, especially the young generation. One effort to improve the quality of human resources is by improving the quality of education. This is because the quality of education is a basic builder of human character, mentality, and spirituality so that it can be used as a benchmark for the quality of a country. Natural Sciences, especially physics in junior high schools (SMP) have an important role in preparing quality human resources, in other words if the activities and learning outcomes of students when learning science physics in SMP are low then the possibility for the next level will also be low.

Based on the results of observations made by researchers in class VIIIa SMP Negeri 4 Batukliang Utara, it is found that the physics learning process at school still uses lecture and teacher methods as the main source of knowledge. The teacher becomes a lecturer and students in the class only listen, take notes, and carry out activities according to the teacher's instructions. The knowledge received by students almost all comes from what is explained by the teacher without knowing how to get new knowledge in learning. Thus, students tend to be passive in learning activities. This learning process can have an impact on student learning activities during the learning process. This can be seen from the small number of students who are active in the

learning process, the small number of students who respond to questions from the teacher, the least students who ask about the material being taught. This has an impact on the low learning outcomes of physics science in students, where the classical completeness of the students' grade of VIIIa SMPN 4 Batukliang Utara is 56.4%, this is still relatively low under the classical completeness criteria value of 85%.

Learning conditions are considered to require learning models that can stimulate students to be active, can express opinions and make students easier to explore their potential through effective learning and not boring in learning physics. Physics science lessons as scientific products in the form of facts, theories, principles, and law (Bahtiar & Prayogi, 2012). Learning models that involve students' experiences such as their relationships with daily life either directly or indirectly. Thus, students are able to relate the concepts they have gained to the experiences they have experienced. This can train students to predict, observe, and understand the phenomena around them, then communicate their findings to others (Evi, 2018). Learning models that can be referred to are the Predict, Observe and Explain (POE) learning model.

The POE learning model is a learning model based on constructivism learning theory. This theory of constructivism states that students must find themselves and transform complex information, check new information with old rules and revise them if the rules are no longer appropriate (Trianto, 2009). Opportunities for students to ask questions and opinions on learning using the POE model are more because students are required to make predictions and observe themselves from existing problems. According to Farikha (2015) research using the POE learning model can improve learning activities and achievements which consist of aspects of knowledge, aspects of attitudes and aspects of skills.

The syntax of the POE learning model in broad outline is predictions written by students relating to the practicum to be carried out or demonstrated (predict), observations of practicum or demonstration activities carried out (observe), and finally students try to deconstruct the results of demonstrations or experiments and explain why this happened (explain) (Suyono, 2015). The POE learning model can make students more active in asking questions and can reduce students' misconceptions in capturing material (Lisa, 2018).

In addition to the learning model, instructional media also determine the quality of learning itself. One of the media that can be used to help students learn independently and can improve students' ability to analyze questions is worksheets. The worksheets is appropriate to be applied in the calculation of material learning, and increasing vocabulary vocabulary (Nugroho, 2014).

Worksheets can help students solve problem counts and memorization which can stimulate students to actively think, actively practice solving problems and be active in the learning process. Because basically with more practice questions, if you encounter difficulties students will tend to ask questions in order to understand. In generally, it can be said that student worksheets are part of learning planning that can be used in learning experimentally or non-experimentally, so that learning objectives can be achieved (Hikmawati and Gunada, 2013).

According to Hana (2019) teaching materials commonly used by schools in general are student worksheets obtained from publishers, not worksheets specifically designed by teachers. this is called a conventional worksheet. The conventional worksheets in terms of appearance are less attractive, such as the type of paper that uses frosted paper and is difficult to read. In addition, the material and discussion in these worksheets are sometimes not in accordance with the characteristics and contexts that are close to the daily lives of students and not in accordance with the model or method applied by the teacher. So that teachers need to use teaching materials that are in accordance with the characteristics of student worksheets, and with the model or method applied so as to improve student learning activities and outcomes.

Based on the description above, the researcher is interested in taking a study entitled of implementation of POE (Predict, Observe, Explain) learning model with worksheets assistance to improve students' activities and learning outcomes.

METHOD

This type of research is Classroom Action Research (CAR). Classroom Action Research (CAR) is a research conducted systematically reflective of various actions taken by the teacher. This research was conducted in two cycles, each cycle containing four steps namely planning, implementing actions, observing/evaluating, and reflecting. This class action research was conducted in the even semester of the academic year 2017/2018 at SMPN 4 Batukliang Utara. The subjects of the research were VIIA students with 22 students. The data collected includes data about the state of students in the form of qualitative and quantitative data. Qualitative data were obtained from observations, activeness questionnaires, and interviews. Quantitative data obtained from the results of the assessment of student achievement in the material pressure both in cycle I and cycle II.

Student activities were assessed by two observers using the instrument observing student activities during the teaching and learning activities taking place. The data obtained were then analyzed using quantitative descriptive using the formula of the ideal maximum score (SMi), ideal mean (Mi), and standard deviation (SDi):

$$Mi = \frac{1}{4}(SMi)$$

$$SDi = \frac{1}{3}(SMi)$$

The results of the calculation of SMi, Mi, and SDi are then converted according to Table 1 as follows.

Table 1. Guidelines for standard scores of student learning activities (Sudjana in Muthmainnah, 2011)

Intervals	Score Interval	Criteria
AS ≥ Mi + 1,5 SDi	AS ≥ 3,005	Very actively
Mi + 0,5 SDi ≤ AS < Mi + 1,5 SDi	2,335 ≤ AS < 3,005	Actively
Mi – 0,5 SDi ≤ AS < Mi + 0,5SDi	1,665 ≤ AS < 2,335	Adequate actively
Mi – 1,5 SDi ≤ AS < Mi – 0,5SDi	0,995 ≤ AS < 1,665	Less actively
Mi – 2,5 SDi ≤ AS <Mi – 1,5 SDi	0,325 ≤ AS <0,995	Not actively
AS < Mi – 2,5 SDi	AS < 0,325	Very not actively

Indicators of success in this study is that if students can achieve classical indicators of success with a minimum completeness criteria of 85%, and students' learning activities are categorized as active.

RESULTS AND DISCUSSION

Observation results of student learning activities in the first and second cycles observed by observers with researchers can be seen in table 2 as follows.

Table 2. The results of student learning activities

Items	Cycle I	Cycle II
Highest score	4	4
Lowest score	1	1
Number of students	22	22
Total of score	12,5	14,2
Score average	2,08	2,36
Criteria	Adequate actively	Actively

Student learning outcomes that have been implemented in the first cycle, obtained student learning outcomes data as in Table 3 as follows.

Table 3. Student learning outcomes in each cycle

Items	Cycle I	Cycle II
Highest score	90	95
Lowest score	55	65
Number of students	22	22
Number of students who scored ≥ 75	12	83,41
Number of students who scored ≤ 75	10	19
Classical average score	73,41	3
Completeness percentage learning	54,55%	86,36%

Based on the results in Table 1, it can be seen that the learning activities of students in cycle 1 are in the adequate actively category as evidenced by the total score obtained by 12.5 and an average score of 2.08. In cycle 2 student learning activities increase, its evidenced by the total score obtained from meeting 1 of 14.2 and meeting 2 of 17.7, for an average score of meeting 1 of 2.36 and meeting 2 of 2.95, so that student learning activities in cycle 2 are said to increase with active category. The results in Table 2 show that the average value of the first cycle class of 73.41, the completeness percentage learning of 54.55%, this percentage is still below the classical indicators of completeness percentage learning success that is ≥ 85%. In the second cycle it was seen that the average grade obtained by 83.42 with the percentage of mastery learning at 86.36%, the percentage of students showing that the cycle II had reached the classical indicators of completeness learning success. In other words, student learning outcomes in cycle II are increasing.

Activities and student learning outcomes in the first cycle have not yet reached the indicator of success. This is because there are still students who do not participate in learning activities properly, students still cannot understand the problems displayed by the teacher, are not optimal in linking predictions with the observations made, are not accustomed to conducting experiments or investigations and working together with group friends so there are still students who are individual in conducting investigation activities. Students also do not have the confidence to present their group's work because they are not accustomed to appearing before their peers. There are still students who do not listen to the conclusions about problem solving that are explained by the teacher.

In addition, the teacher still has not done the learning stages to the maximum and there are still POE stages that are not done by the teacher as the teacher does not explain in advance the learning objectives to be achieved, lack of guidance given to students in conducting experiments and completing worksheets. However, improvements were made to be applied in cycle II. The increase in activities and learning outcomes in cycle II was due to students being actively involved (student centered) during the learning activities and more serious in investigating activities to find the correct concepts. In addition, the teacher has also corrected the deficiencies in the previous learning process.

Based on the results obtained, it appears that the application of the POE learning model has a positive impact on students' grade of VIII SMP Negeri 4 Batukliang Utara. Learning activities implemented require students to be more active (student centered), especially in the investigation activities. Students who previously rarely carried out an inquiry or experimental activity, in this study were required to be able to discover the concepts of physics through direct inquiry or experiment activities. In addition, students no longer just sit listening to the teacher's explanation and taking notes, but also participate in discussion activities so that students can express ideas and are skilled at speaking in front of the class. Through the POE learning model with the help of worksheet applied by the teacher, students can develop their initial abilities, discussion skills, communication skills, observational skills. Based on the results of research and discussion, obtained activity data and student learning outcomes that have increased from cycle I to cycle II and achieve indicators of success in cycle II. Therefore, it can be concluded that the application of the POE learning model with the worksheet assistance on Motion subject matter

can improve the students' activities and learning outcomes grade of VIII SMP Negeri 4 Batukliang Utara. These results are similar to the results of previous studies, which stated that student learning outcomes improved after applying the POE learning model (Sudarmi, et al. 2012).

CONCLUSION

Based on the results of research and discussion, it can be concluded that the POE (Predict-Observe-Explain) learning model with worksheet assistance can improve the students' activities and learning outcomes grade of VIII SMP Negeri 4 Batukliang Utara.

SUGGESTION

The POE learning model with the assistance of worksheets can be used by teachers as an alternative teaching and learning process and for further research it is expected to be able to apply it to other material and be varied with other media.

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