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Improving Understanding of Pressure Concepts in Students of SMP Satu Atap Kanda through Problem Based Learning Model

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ABSTRACT

This research aims to increase the understanding of the concept of pressure in Class VIII students of Kanda Junior High School through the PBL Learning Model with Demonstration and Practice Procedures. This type of research is a type of Classroom Action Research (PTK) which focuses on the classroom atmosphere which is often called Classroom Action Research. The research population is class VIII students of SMP Satu Atap Kanda, one class is taken randomly, namely class VIII B. The method of analyzing information in this matter is to use statistics, tabulating information based on variables obtained from all respondents, Descriptive Statistical Test, and T-test Analysis Method. Based on the results of this research, the description of the concept of pressure in Kanda One Roof Junior High School students has increased. This shows that there is a change in the increase in the students' concept description in the PBL learning model with demonstration and practice procedures.

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INTRODUCTION

In order to enhance the quality education process in the learning area, teachers are required to be able to distribute quality education modules for students to improve the conceptual description of each student in mastering the education provided at school. Teachers are required to be able to be creative in presenting an interesting educational process to students in order to be able to urge students' enthusiasm in exploring the learning process to increase their understanding of the material taught by the teachers. In the educational process, teachers are required to have a competent teaching strategy that can make students work efficiently and effectively in accordance with learning objectives (Tembang, Hermawati, & Rahajaan, 2019).

The ongoing phenomenon related to inefficient learning models and procedures for students can be seen from the Kompas online media report. com on June 16, 2022 tells of the influence of Covid- 19 in the teaching and learning process at the Joint High School in Papua. This matter is due to the existence of online education using technological encouragement which has caused a shrinkage in the learning attention of students at the Joint High School in Jayapura as indicated by the presence of 27 students who disappeared or were absent from the teaching and learning process. This can be caused by the presence of inappropriate educational models or procedures

used by educators during online learning so that student participants are not interested in participating in learning. Not only does this happen in joint high schools but there are similar problems in some schools both at the high school and junior high school levels. In practice, student participants have difficulty mastering the material that is informed because of online education or non-face-to-face education processes, especially in mathematics and science subjects which are difficult for students to understand. The level of difficulty of these subjects can affect the learning attention of students to explore these subjects.

Science subjects are one of the junior high school level subjects which also includes physics material. Science lessons emphasize providing direct experience and improving students' thinking processes through real student actions to achieve the expected educational goals (Tembang, Hermawati, & Rahajaan, 2019). In this case, it proves that junior high school science education is not only collecting facts but also directing methods of thinking, analyzing, understanding concepts and being able to uncover existing problems. The learning that has been carried out can be used both in the world of education and for the survival of everyone.

In learning, teachers are required to be able to use technology as an educational medium for related subjects. Not only that, teachers must also be skilled in preparing educational models or procedures that fit the module to be informed to students to increase student learning attention. To achieve optimal educational goals, teachers can use educational models and procedures that are equipped with appropriate educational media such as demonstration education procedures (Dinata & Wahyudi, 2013). This proves that the demonstration procedure with media encouragement can help students to have great attention in following science subjects.

There is also a Problem-Based Learning (PBL) education model that involves students in an activity or project that creates a product from the results of education. The PBL learning model can urge students to carry out independent activities that take place continuously, emphasizing cooperation and teamwork that can affect the quality of work produced by students. The PBL procedure requires students to construct their knowledge into long-term memory so that during the learning process, the knowledge received through investigation is not just used to solve the problems that have been given (Aristawati, Sadia, & Sudiatmika, 2018).

Exercise is a process of transformation towards a better or simply all efforts that are tried to improve the overall physical condition with a regular and repeated process. According to Harsono (2015), "training is a well-organized process of practicing or working that is tried continuously with more and more exercises or activities of the student".

There are also previous studies that review the PBL learning model and demonstrations carefully by Dinata & Wahyudi (2013) about the value and learning outcomes of students who are given physics learning using demonstration procedures with animated media categorized into good criteria. Aristawati, Sadia, & Sudiatmika (2018) argue that there is a significant comparison of concept understanding between students who learn with problem-based learning models and students who learn with direct learning models. Khalik (2018) states that the research information obtained that there is a difference in student participants in class XI IPA4 SMA Negara 9 Makassar before and after being taught by using demonstration procedures matches the problem

and hypothesis. Next in the research of Gumay & Bertiana (2018) Sourced from research results and reviews, it can be concluded that there is a significant effect of the demonstration method on the physics learning outcomes of class X MA Al- Muhajirin students 2016 / 2017.

Connected to this background, this research has the aim of improving the description of the concept of pressure in class VIII students through the problem-based learning model with demonstration and practice procedures. Is there a significant increase from the PBL learning model with demonstration procedures and exercises on student learning concept descriptions of the pressure module and is there a significant increase from the PBL learning model with demonstration procedures and exercises on pressure material.

This research can share useful data and input for citizens, especially in the field of learning in making useful policies to be able to improve the concept of education that is right for students. For the world of education, this research can be useful in sharing knowledge and useful data for future research related to learning models and learning procedures. For citizens and parties in need, this research is expected to increase data and knowledge about the increase in students' learning concept descriptions.

METHODS

This research was conducted in 2023 on students in grade VIII of SMP Satu Atap Kanda. This research uses a quantitative approach. Based on the purpose of this research is to improve the concept description of pressure material in class VIII students of SMP Satu Atap Kanda using the PBL learning model with demonstration and practice procedures. This type of research is a type of Classroom Action Research (PTK) which is focused on the classroom atmosphere which is often said to be Classroom Action Research.

The population in this research is class VIII students of SMP Satu Atap Kanda as many as 1 class with a total of 17 students. Based on randomization, class VIII B of SMP Satu Atap was selected, consisting of 8 male students and 9 female students. The method tried in this research uses a statistical analysis method where this information is intended for grouping information based on the variables studied, tabulating information based on variables obtained from all respondents, descriptive statistical test, and t-test analysis method. However, before the research took place in the research class, researchers conducted a non-test instrument test as a comprehensive information collection tool which means that it can be used to take into account affective and psychomotor respondents.

RESULT AND DISCUSSION

Based on the implementation of 2 cycles of action which were carried out 2 times a meeting, the results of this research data were obtained from the pre-test and post-test data distributed before and after using the PBL learning model with the demonstration and practice method. It shown as table 1 can be seen that the results of

observations of teacher performance have a performance value in cycle I of 97.8 with very good criteria and in cycle II the teacher performance value is 98.67 with very good criteria.

Table 1. Results of Observations of Teacher Performance When Applying the Problem Based Learning Model with Demonstration and Practice Methods

Cycle	Score	Criteria
1	97.8	excellent
2	98.7	excellent

Comparison of Data on Understanding the Concept of Pressure in Class VIII Students Through a Problem-Based Learning Model with Demonstration and Exercise Method Cycle I and II can be seen in Table 2. From the table above, it can be seen that there was an increase in the class average of 80.58 in cycle I to 83.52 in cycle II, an increase in students completing KKM from 16 students in cycle I to 17 students in cycle II, and an increase in classical learning completeness of 94.11% in cycle I to 100% in cycle II.

Table 2. Comparison understanding concept between problem-based learning and demonstration methods

No	Comparison	Cycle 1		Cycle 2	
		Pre test	Post test	Pre test	Post test
1	Class Average	43.52	80.58	37.05	83.52
2	Completed KKM	2	16	1	17
3	Below KKM	15	1	16	0
4	Completion Classical Study	94.11		100	

Based on the table above, from 17 students of class VIII B, the data results show that the maximum value of the first cycle pretest is 80 and the second cycle is 70, the maximum value of the post-test is the same value of 100, the minimum value of the first cycle pretest is 20 and the second cycle is 10, the minimum value of the first cycle posttest is 60 and the second cycle is 70, the standard deviation value of the first cycle pretest and posttest is 17.65 and 10.28 while the standard deviation value of the second cycle pretest and posttest is 17.23 and 11.15.

Data on the results of research to improve students' understanding of learning concepts is also collected by looking at the results of observing teacher performance seen in Table 1 by conducting research practices in the classroom using assessment tools that are observed and assessed by peers. The data results in Table 1 show that teachers are competent in conducting Classroom Action Research.

Students learning outcomes seen in Table 2 are considered to show a very good improvement, it can be seen that there is an increase in the class average of 80.58 in cycle I to 83.52 in cycle II, an increase in students completing KKM 16 in cycle I students to 17 students in cycle 2, and an increase in classical learning completeness of 94.11% in cycle I to 100% in cycle II.

Then the t-test hypothesis test produced data showing that the significant value (2-tailed) was 0.000. Based on these results, t = 9.961 and 0.000 <0.05, it can be concluded that the improvement of students' understanding of the concept of pressure by using the PBL model with demonstration and practice methods significantly improved the concept understanding and learning outcomes of Kanda One-Stop Junior High School students.

The results of this study describe a significant increase in concept understanding and student learning outcomes related to the value of understanding the concept of learning before and after the implementation of the problem-based learning model with demonstration and practice methods. Descriptively, students who take part in learning with problem-based learning models with demonstration methods have a higher level of understanding of concepts in cycle II compared to when doing cycle I which still needs to make some improvements. The results of the t-test analysis in this study explained the increase in understanding of student learning concepts obtained with a statistical value of F = 9.961 with a significant number (2-tailed) 0.000 which is smaller than 0.05. From the statistical results obtained, it means that there is a significant increase in the understanding of the concepts of students using the PBL learning model with the demonstration and practice method and those who have applied the PBL learning model with the demonstration method on the material of science subject pressure in class VIII SMP Satu Atap Kanda in the 2022/2023 school year.

From the results of this study, it can be seen that students before and after being treated have a good improvement so the results of this study have proven that learning using a problem-based learning model with demonstration and practice methods greatly affects the improvement of students' understanding of learning concepts, especially in pressure material because the problem-based learning model requires students to construct their knowledge into long-term memory and to learn more actively in problem-solving, finding out their knowledge and producing products so that students are more motivated in developing their knowledge and developing their learning products. Likewise, the demonstration method that has been carried out by researchers has proven to be able to help students manage their learning, and stimulate student thinking because students are assisted by the right learning media and accompanied by exercises in the form of pretests and posttests which also help raise the level of understanding of student learning concepts and recognize phenomena in their daily lives. The student learning atmosphere that occurs can also reduce student boredom or boredom in the learning process because students are given a stimulus to solve their learning problems and design their own learning strategies.

CONCLUSION

From the data and hypothesis research that has been carried out, it can be concluded that there is a significant increase in concept understanding of students in class VIII SMP Satu Atap Kanda through the PBL learning model with demonstration and practice methods. This can be seen through the increase in classical learning completeness of 94.11% in cycle I to 100% in cycle II and from the results of the t-test F = 9.961 with a significant number of 0.000 <0.05. Students learning using the problem-

based learning model with demonstration and practice methods show an increase in understanding of higher concepts so the application of the problem-based learning model with demonstration and practice methods makes a positive contribution to students and should be applied later in the science learning process, especially pressure material.

Suggestions that can be put forward by researchers are based on the results of this study which shows a significant increase in understanding of learning concepts through the PBL learning model with demonstration and practice methods, therefore it can be used as reference material in the science learning process at school. It is recommended that teachers apply the PBL learning model with demonstration and practice methods in learning activities to improve students' understanding of learning concepts.

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