Effect of PBL and TPS Learning Models on The Quality of Learning

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Abstract: The purpose of this study is to determine the effect of Problem-Based Learning and Think Pair Share (TPS) learning models on the quality of learning in Class VI Elementary School students in Gugus Diponegoro District Bonang, Demak Regency. This research used experimental research with research techniques through tests, observation, and documentation. The study population was 72 school clusters with samples in class VI Wonosari Elementary School, Elementary School number 2 Jali, and Public Elementary School number 4 Weding. The results of the study used a problem-based learning (PBL) model, the class average was 84.83 and completeness learning 97%. Learning think pair share score was average 82.73 and learning completeness was 95%. The value of F count is <F table is 0.821 <2.014. Based on this study, it is suggested that teachers need to use appropriate learning models so that the quality of student learning increases.

Keywords: Problem based learning (PBL), think pair share (TPS), the quality of learning

1.   Introduction

The curriculum refers to the implementation of education both in Indonesia and all countries in the world (Andrian, Kartowagiran, & Hadi, 2018). The educational curriculum has clear goals and is expected by all parties, both students, educators, society as well as all parties involved in it, especially the government. The curriculum implemented in Indonesia is inseparable from educational goals, educational conditions, educational needs, and the times (Suyanto, 2017). The curriculum follows the current conditions and needs of the country. Therefore, the curriculum must be improved or developed in accordance with its main objectives. The aim of education in Indonesia is to educate the nation's life as stated in the National Education System Law number 20 of 2003.

The current Indonesian curriculum uses the 2013 curriculum which has undergone revision. The purpose of curriculum revision is to create quality learning (Machali, 2014). One of the ways in which the 2013 curriculum revision is to separate some lesson content from thematic learning. In accordance with Permendikbud No. 24 of 2016 in chapter I article 1 item 3, separate lesson content is Mathematics and Physical Education, Sports and Health in grades 4, 5, and 6. For separate lesson content, separate teacher books and student books are compiled.

All schools implement the revised 2013 curriculum, including all 72 school clusters in Demak Regency and one of them is all schools in the Diponegoro Gugus area. The Diponegero Cluster is one of the school clusters in the Bonang District, Demak Regency. In learning at school, as in general, teachers use teacher books and student books as guidelines. This book should make it easier for teachers to carry out the learning process to deepen students' abilities in accepting the concept of the material being taught (Prahl, 2017). But the reality in the field, even though the teacher's books and student books have

been prepared, there are still many problems during the learning process. Learning in schools is not optimal so that the quality of learning is not achieved (Dita et al., 2021).

According to Dimyati & Mudjiono (2015) good quality of learning can be achieved if a teacher can manage, design and process learning by referring to everything that can be a benchmark for a teacher in achieving learning success. The determinants of this learning process are the characteristics of the objectives, the characteristics of the field of study, the characteristics of students, the characteristics of the environment, and the characteristics of the teacher. All the characteristics of determining learning must support learning, so that the quality of learning can be as expected.

The learning problem in the Dipenogoro Cluster, Bonang District, Demak Regency is that teachers and students have not been able to synergize optimally. There are still many teachers still using conventional learning methods or lectures. Teachers are still dominant in learning, so teacher centered learning is more visible than student centered learning. All learning is still teacher centered. Students are less active in accepting learning and some even enjoy playing alone. This is what causes the quality and student learning outcomes to be low.

This problem needs to be resolved immediately to create the expected quality of learning. The learning process that was originally conventional in nature needs to be transformed into innovative and cooperative learning with students to become a learning center. The teacher only acts as a facilitator and guide for students when experiencing difficulties. To create the quality of learning, experimental research was conducted, using a Problem Based Learning (PBL) model and Think Pair Share (TPS) (Almujab et al., 2018). Problem based learning according to Murtono (2017) is an interaction between stimulus and response, which is the relationship between the two directions of learning and the environment. Problem based learning model is a very effective model for high level teaching.

Learning Problem Based Learning (PBL) is the interaction between the stimulus response, which is a two-way relationship between learning and the environment. Problem Based Learning (PBL) model is a very effective model for high level teaching. This learning helps students to process existing information into new knowledge which they compile themselves.

Unlike the Problem-Based Learning (PBL) model, Think-Pair Share (TPS) learning model is a cooperative learning model to influence student interaction patterns. Think-Pair Share (TPS) learning model, students are encouraged to work together and help each other in small groups.

The right learning model is needed to create maximum learning quality. A teacher must be creative and innovative. The teacher's role is very important in the learning process. This research was conducted to determine the effect of the Problem-Based Learning model and Think pair share (TPS) on the quality of learning during the learning process. The hope in this study can provide an overview of the effect of the problem-based learning (PBL) model and Think pair share (TPS) on the quality of class VI mathematics learning in the Diponegoro Cluster, Bonang District, Demak Regency.

The formulation of the problem is based on the limitations of the problem in this research. The formulation of the research problem is:

a. Does the problem-based learning (X_1) learning model affect the quality of mathematics learning in Grade VI (Y) Elementary School students of Diponegoro Cluster, Bonang District, Demak Regency?
b. Does the Think pair share (TPS) learning model (X_2) affect the quality of learning in SD (Y) Diponegoro Cluster, Bonang District, Demak Regency?
c. Do the problem-based learning (X_1) and Think pair share (X_2) learning models affect the quality of mathematics learning in Grade VI (Y) Elementary School students of Diponegoro Cluster, Bonang District, Demak Regency?

Departing from these problems, there needs to be active, creative, and fun learning for students. With active students, it will reduce the dominance of the teacher in learning. Teachers are expected to only act as facilitators to foster student creativity. The activeness and creativity of students in this learning is formed by holding a learning model of PBL and TPS (Kaddoura, 2013). The frame of mind in this study can be shown in Fig 1.
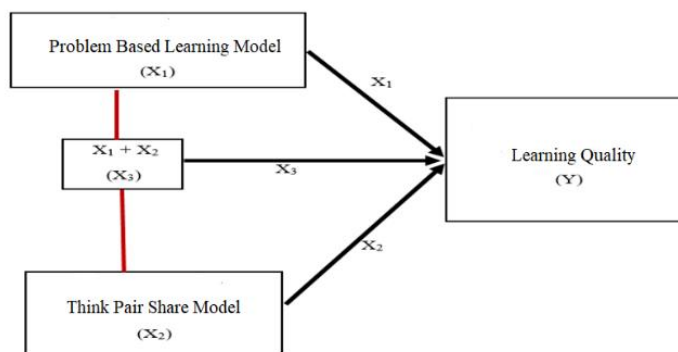
Fig. 1: Framework of thinking

The scope of this research is to look at the following:

- The effect of the application of problem-based learning (PBL)and Think pair share (TPS) learning models on the quality of learning in grade VI elementary school students in the Diponegoro Cluster, Bonang District, Demak Regency.
- This research was conducted on grade VI students in the Diponegoro Cluster, Bonang District, Demak Regency.
- The sample in the study was elementary school in the Diponegoro Cluster.
- The research was conducted in semester 1 of the 2019/2020 school year.
- The research was carried out referring to the 2013 curriculum.
- The study was conducted to focus on mathematics subject matter around the circle.
- This study focuses on the problem-based learning (PBL) model and Think pair share (TPS) on the quality of learning in elementary school students in grade VI.

2.   Research Method

This study employed experimental research design. The research design used the pretest-posttest control group design with 2 school as experimental class and 1 school as control class. Students from the Diponegoro School cluster, Bonang District, Demak Regency. Public Elementary School Wonosari and Public Elementary School number 2 Jali participated as the experimental class and Public Elementary School number 4 Weding as control class.The sampling technique used was random sampling technique or random sample in which the school was considered to have subjects in the same population.

Value testing is based on the test results obtained by students. Before being tested, the test is tested first to meet good requirements in terms of validity, distinguishing power, and level of difficulty. For data analysis, a data prerequisite test was held which consisted of a distribution normality test and a variance homogeneity test.

3.   Results and Discussion

The results of the initial class normality test in experiment 1 and 2 obtained the following data at Table 1.

Table 1: The results of the Initial Class Normality Test in Experiment 1 and 2

Class	Lo	L table	Conclusion
Experiment Class 1	0,151	0,165	Normal
Experiment Class 2	0,155	0,189	Normal

From the Table 1 shows the results of the pretest values obtained in the experiment class 1 Lo = 0.151 and L table = 0.165. Because Lo <L table, Ho is accepted so that the sample comes from a normally distributed population. Whereas in experiment class 2 the resulting value is Lo = 0.155 and L table = 0.189. Because Lo <L table, Ho is accepted so that the sample comes from a normally distributed population. Lo in both experiments shows that Lo is smaller than L table (Lo <L table). From this data, it can be concluded that Ho is accepted, meaning that in the initial normality test, the experimental class 1 and the experiment class 2 were both normally distributed.

Table 2: The results of the posttest value

Data	Experiment Class 1 (*Problem based learning*)	Experiment Class 2 (*Think pair share*)
Standard Deviation	13,261	10,843
Lt (L table)	0,165	0,189
Lo (L count)	0,145	0,174
Conclusion	Normal	Normal

From Table 2 shows the results of the posttest value, the first experiment, value of Lo (L count) is 0.145, while the L table value is 0.165. The result of Lo <L table is 0.145 <0.165 which means that the first experiment class uses the problem-based learning model with normal distribution. In the second experiment, Lo (L count) was 0.174, while the L table value was 0.189. The result of Lo <L table is 0.174 <0.189, which means that the second experiment class using the Think pair share (TPS) learning model is normally distributed.

Table 3: The results of F count

	Experiment 1	Experiment 2
Mean	88,6206897	82,27272727
Variance	105,172414	123,1601732
Observations	29	22
Df	28	21
F	0,85394825	
P(F<=f) one-tail	0,34326299	
F Critical one-tail	0,51381593	

Table 3 shows the F test or simultaneous test (model test/ANOVA test), the results of F count = 0.8539 while the one-tail critical f or f table is 0.5138. Then the conclusion of the effect of the experimental class treatment is accepted because F count> F table, namely 0.8539 > 0.5138 and the data is significant.

3.1.   The Influence of Problem Based Learning Model on Learning Quality

Based on the descriptive results of the post-test scores of experiments 1, it was concluded that the quality of learning model of problem-based learning was successful as expected. This proves that the problem-based learning model has an effect on the quality of mathematics learning about basic competencies in estimating the circumference and area of the circle of class VI. Supporting the influence of the PBL model on the quality of mathematics learning, students are able to achieve a class average of 84.83 and 97% completeness learning and 90 observations.

This research is in line with Sumartini's (2015) research in a study on the Improvement of Students' Mathematical Reasoning Ability through Problem-based learning (PBL) concluded that the increase in mathematical reasoning abilities of students who get problem-based learning (PBL) is better than students who get conventional learning (Mohmed, 2021). From the results of the study, it was found that the experimental class learning outcomes with the number of respondents 34 obtained an average pretest 50, 6 and 72.8 posttests.

3.2.   Influence Learning Model Think Pair Share on the Quality of Education

Based on the descriptive results of the posttest value of Experiment 2, it was concluded that the learning quality of the Think pair share (TPS) learning model succeeded as expected. This proves that the Think pair share (TPS) learning model has an effect on the quality of mathematics learning about basic competencies in estimating the circumference and area of class VI circles (Harun et al., 2021). Supporting the influence of the Think pair share (TPS) learning model on the quality of mathematics learning, students are able to achieve a class average of 82, 73 and learning completeness 95% and the observed value obtained is 82.5.

The study, together with this study is the research conducted by Zulfah (2017) in the study Effects of Cooperative Learning Model Application Think pair share (TPS) Heuristic Approach Against Student Mathematical Problem Solving Ability Madrasah Tsanawiyah Naumbai Kampar generate data $t h itung$ = 3.95, with α = 0.05 and df = 38 from the t distribution list, it is obtained $ttabel$ = 2.02. From calculations obtained $t h itung$ = 3, 95.

The first experiment which aims to determine the effect of the PBL model on the quality of mathematics learning in grade VI was carried out at Public Elementary School Wonosari with a total of 29 students. The posttest results showed 97% completeness of learning as many as 28 students and the observation results obtained a value of 90 with a class average of 84.83. And the second experiment which aims to determine the effect of the TPS learning model on the quality of class VI mathematics learning carried out at Public Elementary School number 2 Jali with a total of 22 students. In this study students were able to achieve a class average of 82.73 and learning completeness of 95% as much as 22 students and the observation value obtained was 82.5.

For the control class in this study carried out in Public Elementary School number 4 Weding, it produced data on students who passed the minimum completeness criteria of 12 students and did not pass as many as 4 students with an average obtained of 74.275 and a graduation rate of 75%. From these results it can be concluded that the PBL and TPS learning model on the quality of Class VI Mathematics learning in the Diponegoro Cluster, Bonang District, Demak Regency. Sobri (2013) in Fostering Teacher Professionalism in Improving the Quality of Learning explained that the success of teachers in teaching cannot be separated from the quality of learning they carry out.

4. Conclusion

Based on the results of research and discussion of the effect of Problem-Based Learning (PBL) and Think Pair Share (TPS) learning models on the quality of Class VI Mathematics learning in the Diponegoro Cluster, it can be concluded that quality learning can produce optimal learning quality. The use of varied learning models greatly supports the creation of the desired quality of learning. Teachers need to improve their quality in order to create creative and fun learning. In learning teacher need to use appropriate learning models so that the quality of student learning can be optimal.

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