

## Implementation of the PBL Learning Model in Class V Mathematics at SD Negeri Sari 1

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### Abstract

This study aims to determine the implementation of the PBL learning model. This learning model aims to improve student learning outcomes in the material of distance, time, and speed in class V SD Negeri Sari 1, Gajah District, Demak Regency. In this study, an experimental method with a quantitative approach was used and research techniques through tests with the research site in class V SD Negeri Sari 1. In data collection, tests, documentation and interviews were used. Data analysis using qualitative descriptive analysis. Based on the results of research conducted, the application of the PBL learning model to improve student learning outcomes in the material of Distance, Time, and Speed in Class V Elementary Schools has stages in its learning activities. Conclusion In its implementation, it is known that students are more creative and enthusiastic in the learning process of Mathematics, the material for distance, time, and speed, and student learning outcomes have increased quite high.

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### Introduction

Elementary school education is basic education which plays an important role in shaping children's personality and mindset. At the elementary school level, children are taught various sciences as a foundation for children to undergo education at the next level. Mathematics is the main subject taught in Elementary School education. Mathematics is a science that plays an important role in the development of science and technology, both as a tool in the application of other fields of science and in the development of mathematics itself. In other words, mathematics has a very essential role, especially for science and technology.

According to Adam (2007). ) "Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate at the end of a period of learning. They are usually defined in terms of a mixture of knowledge, skills, abilities, attitudes and understanding that an individual will attain as a result of his or her successful engagement in a particular set of higher education experiences". This opinion states that learning outcomes are not only about what is known, understood, and shown at the end of learning but learning outcomes include knowledge, skills, abilities, attitudes and understandings that a person will achieve as a result of his successful involvement in learning. Sudjana (2005) previously also had the same opinion that learning outcomes are abilities that students have had after experiencing the learning process.

There are four important components that influence the learning process and for student success, namely learning materials, learning atmosphere, media and learning resources, and teachers as learning subjects. The teacher as one of the elements in the teaching and learning process has an important role, namely as a teacher who transfers of knowledge and as a guide who encourages student potential in learning (Firmansyah, 2015). Meanwhile, the curriculum becomes a rule and order in the implementation of education. The curriculum implemented in Indonesia is inseparable from educational goals, educational

needs, educational conditions, and technological developments. Therefore, the curriculum must be developed in accordance with the main objectives of education in Indonesia as stated in the National Education System Law number 20 of 2003.

The elementary school in Gajah District, Demak Regency, simultaneously from grade I to grade VI implements the 2013 curriculum starting in the 2018/2019 academic year. Learning curriculum 2013 uses integrated thematic learning except mathematics. From the past, until now, mathematics is still considered a difficult and difficult subject to understand for students, so that every time they face maths lessons, children become lazy and even fear comes to their minds. So that in mastering the concept of lessons delivered by the teacher it becomes minimal and less mature. In addition, in learning, many teachers still use conventional methods, where teachers are still dominant in learning so that they become teacher centered learning. Teacher-centered learning makes children less active and some even enjoy playing alone. This has an impact on the learning outcomes they get to be low. In mathematics, student learning outcomes based on daily assessments of distance, time, and speed are still low and do not meet the minimum completeness criteria (KKM).

This problem needs to be resolved immediately with a change in the learning process that is more innovative and cooperative, one of which is by conducting experimental research and learning system innovation. This effort is made to improve student learning outcomes. To solve the above problems, the Problem Based Learning (PBL) learning model is applied.

Problem Based Learning (PBL) learning model is the interaction between stimulus and response, which is the relationship between two directions of learning and the environment. Problem based learning is an effective model for teaching higher order thinking processes. This model is a learning approach in which students work on authentic problems with the intention of compiling their own knowledge, developing inquiry and higher-order thinking skills, developing independence, and self-confidence (Murtono, 2017).

## **Research Methods**

The research method used in this research is experimental research with a quantitative approach. Experimental research was conducted to determine the causal relationship between variables. The research design used was a pretest-posttest control group design. Pretest-posttest control group design is a type of experimental research with true experimental type. True Experiments are experiments that are actually being carried out. In this study control all external variables that affect the course of the experiment. The characteristics of this design are that there are groups that are divided into experimental class and control class.

### **1.1 Data Source**

The subjects of this study were all students of class VA SD Negeri Sari 1, class VB SD Negeri Sari 1, and class V SD Negeri Sari 2 Gugus Sultan Agung, Gajah District, Demak Regency. These three schools were taken randomly from several schools in the Sultan Agung Cluster, Gajah District, Demak Regency.

### **1.2 Data collection technique**

Research techniques are needed to obtain accurate data. The techniques used in this research are tests, documentation, and interviews. The purpose of using test techniques is to measure student learning outcomes after the learning process. The test data were obtained from the results of the pretest and posttest which were carried out by students in the

experiment. The test result data is used to reflect on the results of the learning process carried out. The purpose of documentation is to obtain research analysis data. The data taken were daily test scores, report cards, student attendance, and journals. The purpose of the interview is to strengthen the research results which are focused on the supporting power of research activities. The data used are in the form of interviews with sources. By interviewing, it can be seen the effect of the learning process before the research was held and after the research. Sources of data used as resource persons in this study were the principal, teachers, and students from the school who became the experiment.

### 1.3 Test Analysis Technique

The test used for data collection was in the form of an essay test with a total of 10 items, in which the selection of questions paid attention to the material or material being asked and the time used to solve the questions. The test requirements used must meet good requirements in terms of validity, reliability, differentiation, and level of difficulty. After the data is normal and homogeneous, hypothesis testing uses the sample F-Test with the help of calculations via Microsoft Excel.

## Results and Discussion

Problem Based Learning (Problem Based Learning) is an interaction between stimulus and response, which is the relationship between the two directions of learning and the environment (Murtono, 2018). Learning problem based learning 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. This learning is learning where students work on authentic problems. Students structure their own knowledge, develop inquiry and higher order thinking and develop a sense of independence and trust.

Problem Based Learning Syntax in Murtono (2015) are as follows: Stage 1 (student orientation to the problem) This stage the teacher explains the learning objectives, explains the logistics needed, proposes phenomena or demonstrations or stories to address problems motivating students to engage in activities problem solving selected. Stage 2 (organizing students to learn) This stage the teacher helps students to define and organize learning tasks related to the problem. Stage 3 (guiding individual or group investigations) This stage the teacher encourages students to collect appropriate information, carry out experiments, to get explanations and problem solving. Stage 4 (developing and presenting the work) This stage the teacher helps students plan and prepare appropriate work such as reports, videos, and models and helps students to share assignments with their peers. Stage 5 (analyzing and evaluating the problem-solving process) This stage the teacher helps students to reflect or evaluate their investigations and the processes they use.

Strobel and Barneveld (2009) says in the conclusion that a meta-analysis was carried out which provided a synthesis of PBL effects compared to traditional forms of teaching. This study used a qualitative meta-synthesis approach to compare and contrast the assumptions and findings of meta-analytic studies on the effectiveness of PBL. The findings show that PBL is superior in terms of long-term retention, skill development and student and teacher satisfaction, while traditional approaches are more effective for short-term retention as measured by standard board examinations.

Selcuk (2010) says that the problem-based learning method not only encouraged students' in-depth approach to learning, but also increased interest in physics subjects. The

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results also signal that physics-based PBL instruction positively impacts student achievement in physics. The paper ends with several implications for physics instruction. Furthermore, Preeti's research, Bajaj et al. (2013) states that as "Science of Medicine" is progressing day by day, the need for better pedagogy and learning techniques is very important. urgent. Problem-based learning (PBL) is an effective way of providing medical education in a coherent, integrated and focused way.

Further research conducted by Gunantara, Suarjana, Riastini et al. (2014) showed that the application of the Problem Based Learning (PBL) learning model can improve problem solving abilities, namely from cycle I to cycle II of 16, 42% of the criteria are being high. This shows that the PBL learning model can improve problem solving abilities in mathematics subjects. Next, Research Albanese et al. (2014) states that over the past 30 years, problem-based learning (PBL) has become a major force in health professional education and even in the world of education. The results identified in this review are described as well as the strength of the evidence used in their support. The results of this review are supplemented by results from selected articles that describe how PBL can produce the results identified.

Safrina and Saminan (2015) showed that it affects the application of the PBL model. This influence can be seen from the results of hypothesis testing, the value is significantly smaller than  $\alpha$  (0.05). And then Sumartini, (2015) shows the experiment of the Effect of Problem Based Learning and Contextual Teaching and Learning Learning Models on Mathematics Learning Outcomes in Class V Elementary School Students of Gugus Sultan Agung is better. Factors that cause better results, because the quality of learning produced by this study is better and completes previous research.

Compared to the research conducted by Utaminingsih, et al (2015) in the application of the Problem Based Learning Model (PBM) this research is better. This is because the activeness of students and the effectiveness of teachers in teaching is more visible than previous studies. Learning outcomes are increasing, this can be seen from the results of the final research test. By using experimental research on the problem-based learning model of mathematics learning outcomes, it was shown that students were able to achieve a class average of 83 and 100% learning completeness by 20 students, while previous research showed that the results of students were able to achieve 83.3% completeness learning.

Research by Yuliati (2017) shows Worksheets can improve students' cognitive, psychomotor learning outcomes. The increase in cognitive learning outcomes of students who have learned to use worksheets is higher than students who have received learning without worksheets. LKS can also develop student character. Research Vaira, et al. (2017) state PBL learning activities are 80% very effective and CTL learning activities are 60% effective. In conclusion, CTL and PBL have effectiveness in improving learning outcomes.

Based on comparisons from previous research, experimental research The effect of PBL learning models on student learning outcomes in fifth grade mathematics at SD Gugus Sultan Agung, Gajah District, Demak Regency is better. This research is better because this research is a refinement of the previous one. This can be seen from the posttest results obtained. The success of the research because the teacher explains with the right model and the growth of activeness of students in receiving learning. The influence of the PBL learning model on mathematics learning outcomes is shown by the students being able to achieve a class average of 83 and 100% learning completeness by 20 students.

The results of the research carried out have in common with research Al Mujab, et al (2018); Malinda, Murtono, and Zuliana (2017); Oktavianti and Santoso (2015); Zuliana (2015); Jannah and Zuliana (2014); and Sumaji (2014). Al Mujab, et al (2018) says based on the observation result in this cycle, in general the implementation of the action has not achieved satisfactory results. While based on the results of questionnaires about the implementation of learning obtained information that most learners feel happy with economic learning by using learning methods PBL. This is because learning by using PBL is able to generate student learning activities in learning. Next, Malinda, Murtono, and Zuliana (2017) research shows that there was an increase of problem solving ability of mathematics in cycle I and Cycle II, that is from 70,92 (good) to 74,28 (good) with percentage of classical learning completeness equal to 64% to 86%. Supported by an increase in problem solving activity students score 2.51 (good) to 3.01 (good). In addition, teachers' skills in managing mathematics learning also increased by 74% (good) to 85% (very good).

Meanwhile, Oktavianti and Santoso (2015) research shows that Problem Based Learning can increase the result of civic education. This result can see from the indicator. The percentage of the result study of cognitive test evaluation from cycle 1 is 60% increase 85%, then cycle 2 with the average class cycle I 75,75 become 80.50. The result study of affective in cycle 1 is 67, the qualification is good become 82 in cycle II the qualification is good. The result of study of psychomotoric of cycle I is 60% with qualification is good become 85% with qualification is good in cycle II. Next, Jannah and Zuliana (2014) says application of problem based learning model in fractions material can improve students' mathematics problem solving, learning activities of students in problem solving, as well as the skills of teachers in the learning of mathematics. Futhermor Sumaji (2014) says based on the data analysis, the results of this research are as follows. (1) Learning model of Problem Based Instruction gives better learning achievement of Mathematics than Group Investigation and the Direct one. Learning model of Group Investigation gives better learning achievement of Mathematics than direct leaning model, (2) Students with high interest in learning has better learning achievement of mathematics than students with middle interest in learning and the low one and students with middle interest in learning has better learning achievement of mathematics than students with the low one, and (3) The students with high, middle, and low interest in learning, learning model of Problem Based Instruction gives better learning achievement of mathematics than learning model of Group Investigation and the direct one and Learning model of Group Investigation gives better learning achievement than the direct one.

## Conclusion

Based on the results of research and discussion of the effect of the PBL learning model on the mathematics learning outcomes that have been implemented, it can be concluded that the PBL learning model has an effect on mathematics learning outcomes regarding the basic competencies of distance, time, and class speed 5. The effect of problem based leaning learning models on results learning mathematics, shown by the students being able to achieve a class average of 83 and 100% learning completeness by 20 students.

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