

# Effectiveness of the Saintificial Approach to the Ability of Problem Based Learning Model Solving the Problem And The Results of Student Learning In Natural Knowledge Science In Basic School

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**Abstract-** The study is intended to determine the effectiveness of the approach to scientific models of problem based learning to the ability to solve the problem and the result of learning of students in the eyes of subjects science knowledge of nature in the school base . The subjects of this study were 28 students of class IV A SDN Janti I Waru Academic Year 2018/2019. This study uses design one group pretest-posttest . The independent variable in this study is the scientific approach with the problem based learning model while the dependent variable is the ability to solve problems and student learning outcomes . Instruments research were used directly is sheet test to solve the problem and sheets test results of learning . Data collection techniques using pretest tests ( pretest and posttest ). Mechanical analysis of the instrument using the test validity and test reliability , while technical analysis of the data using a test for normality , test of homogeneity , test the hypothesis . P- value results from paired samples t-test Sig. (2-tailed) = 0,000 <0.05, then Ha is accepted or there is a significant difference between the results of the pretest and posttest . Based on the results of the research and discussion it can be concluded that there is the effectiveness of the scientific approach to the probem based learning model on improving the ability to solve problems and learning outcomes of students of science subjects in elementary schools .

**Index Terms-** Scientific approach , problem based learning, problem solving skills , learning outcomes .

## I. INTRODUCTION

The 21st century is marked the acceleration in terms of connectivity that is not Inevitable , if not there are limitations of space and time . Problems that occur even Often change along with the development of information and technology in carrying out daily activities . Problems in the world of real involving a multipronged and perspectives are mutually related to one each other. The problems are more complex, it requires a skill that can bring us Able to Compete in an age like this , some skills are needed in a century have them is communication skills , collaboration skiil , critical thinking and problem solving skills, and creativity and innovation skiil ( Hosnan , 2014).

Implementation of the curriculum in 2013 is one of the forms of the Efforts of government in the system of National Education to produce a generation that qualified it . The implementation of the 2013 curriculum is expected to be Able to develop the potential of students in Reviews their skills to speak , write , develop creativity and even solve problems in daily life . The approach that is used in the curriculum in 2013 is the approach scientifically that requires students to move like the researcher or scientist . The implementation of Reviews These activities is of course adapted to the level of elementary school children the which is simpler and Easier to understand . The process of learning to approach scientifically to develop the ability of the basic form of physical , psychological and social are useful for finding facts and concepts , or to develop attitudes and values that foster the skills of others in itself . Scientific approach becomes very important in the activity of learning for the development of science knowledge that is rapidly , if only to use the lecture to teach facts and concepts that learning does not give an opportunity to students to find their own concept of it . The concept which is Obtained by finding itself would be significant and lasted long in participant memory students . Program Note for International Student Assessment (PISA) in 2012, Indonesia ranked 64 out of 65 participating countries to take the test, a

math ability score of 375, a scientific ability of 396 and a reading ability of 382. The data shows that students in Indonesia are still at the level of the Lower Order Thinking Skill (LOTS) (OECD, 2014).

Learning with the models of Problem Based Learning Allows develop the skills to think of students in terms of reasoning , communication , and connection in the process pemecahan problem . The models of learning is based on the theory of learning constructivism roomates knowledge will occur through the process of finding and experiencing through experience alone . Model Problem Based Learning is very relevant to teach the ability to solving the problem since presenting problems that manifest that exist in the surrounding students , involvement of students is directly in solving the problem by integrating a variety of concepts and skills from various disciplines of science . Activities that do the students in a model of of learning is among others Determine the problem , analyze the problem , seeking information to find solutions , berkomunikasi solving problems , and memgevaluasi solving problems such . Results of question answer with teacher grade SDN Janti I in teaching Science Knowledge Alam were conducted during this has a tendency only form of activity to remember , memorize , listen and write anything that was asked by the teacher. Learning Science Knowledge Alam less raises the creativity of students , and most students are not Able to find the solution of the problem to the problems that are being faced . Learning in Janti I Elementary School is known that there are still some obstacles in teaching and learning activities, especially in the science load . The constraints are that students are Able to understand concepts , memorize , but are still lacking in problem solving skills that are associated in everyday life . Based on the results of observations on the Second Semester Assessment of the content of Natural Sciences with the scientific approach it is said to be still low, because there are 46.42% or as many as 13 students who score below 77. Minimum completeness criteria (KKM) in Class IV in Science at SDN Janti I is 77, and as many as 15 students or 53.57% who reach KKM from 28 students. .

## II. METHODOLOGY

The type of research this is a research experiment with methods One Group Pre-Test and Post-Test Design were conducted on one group alone , without the group comparison , the measured or observed not only after the administration of treatment but also before treatment (Fraenkel & Wallen, 2009).

Table 1

|    |   |    |
|----|---|----|
| O1 | X | O2 |
|----|---|----|

Information :

O 1 : Pre test .

X : Treatment

O 2 : Post test

Research is conducted in SDN J anti- I , Java East with the subject of study as many as 28 students in the class IV A Year Doctrine 2018/2019. Data collection techniques using tests . Tests are used to measure the ability to solve problems and student learning outcomes . The test is done two times that before mater i was given ( pre-test ) and after the administration of the material with a model of problem-based learning ( post-test ). Mechanical analysis of data research is among analysis items and analysis of the results of the test . Analysis of grain problem using the test the validity of the correlation product moment and test reliability using the Spearman brown. Analysis of the test to test for normality , test of homogeneity , and paired samples T test with the help of SPSS 21. Test normality is used to determine whether the data is distributed normally or not , while the test of homogeneity aims to determine whether the samples have the variants are the same or homogeneous . P enujian normality and homogeneity of data with a level of significance of > 0.05 or 5%. Paired samples t test was used to determine the significance between the results of the pre test and post test with sig <0.05 so that there was effectiveness in the study or Ha was accepted.

## III. RESULT AND DISCUSS

Based on the results of the analysis show that the scientific approach to the problem based learning model effectively improves problem solving skills and student learning outcomes . Improved student problem solving skills from the results of the pretest and posttest analysis.

Table 2

Average Value Increased Ability to Solve Problems at Pretest and Posttest

| Implementation | Ability greatly Very Good | Good ability | Good enough ability | Ability Less Good | Class average |
|----------------|---------------------------|--------------|---------------------|-------------------|---------------|
| Pretest        | 4                         | 14           | 9                   | 1                 | 68.46         |
| Postes         | 8                         | 17           | 3                   | 0                 | 80.00         |

|                              |   |   |   |   |       |
|------------------------------|---|---|---|---|-------|
| Increased pretest - posttest | 4 | 3 | 6 | 0 | 11.54 |
|------------------------------|---|---|---|---|-------|

Table 2 Obtained information that at the pretest students who were used to solving problems were only four students , while in the posttest they Increased to 8 students . The increase in class average at pretest and posttest was 11.54.

Table 3  
 Increased Achievement of Indicators of the Ability to Solve Problems at Pretests and Postes

| Indicator                              | Indicator Criteria | Pretest | Postes | Increased $\Sigma$ of students |
|--|--------------------|---------|--------|--------------------------------|
| Understanding the Problem              | Very good          | 1       | 3      | 4 (14.28%)                     |
|  | Well               | 19      | 20     |                                |
|  | Good enough        | 8       | 5      |                                |
|  | Not good           | 0       | 0      |                                |
| Designing and planning problem solving | Very good          | 2       | 7      | 7 (25%)                        |
|  | Well               | 19      | 20     |                                |
|  | Good enough        | 6       | 1      |                                |
|  | Not good           | 1       | 0      |                                |
| Looking for a solution of the problem  | Very good          | 6       | 12     | 13 (46.42%)                    |
|  | Well               | 8       | 13     |                                |
|  | Good enough        | 12      | 3      |                                |
|  | Not good           | 2       | 0      |                                |
| Review / check again                   | Very good          | 6       | 10     | 9 (32.14%)                     |
|  | Well               | 11      | 16     |                                |
|  | Good enough        | 11      | 2      |                                |
|  | Not good           | 0       | 0      |                                |

Table 3 it is known that the increase is of the pretest and posttest number of students who understand the problem is 4 students with a percentage of 14:28%. Indicators of designing and planning problem solving has increased as many as 7 students with a percentage of 25%. Increased as much as 13 students occurred on the indicators looking for the solution of the problems with the percentage of 46.42%. Indicators fourth namely reviewing / checking back as many as 9 students or 32.14% Increase .

Table 4: Test Results *Paired Samples T Test* Ability to Solve Problems

|        |                    | Paired Differences |                |                 |   | t      | df     | Sig. (2-tailed) |       |
|--------|--------------------|--------------------|----------------|-----------------|---|--------|--------|-----------------|-------|
|        |                    | Mean               | Std. Deviation | Std. Mean Error | 95% Confidence Interval of the Difference |        |        |                 |       |
|        |                    |                    |                |                 | Lower                                     |        |        |                 | Upper |
| Pair 1 | posttest - pretest | 11,357             | 5,658          | 1,069           | 9.163                                     | 13,551 | 10.621 | 27              | .000  |

Based on the analysis of the Paired Samples T Test on the data on problem solving ability, the results were obtained sig (2-tailed), which is  $0,000 < 0,05$ , it can be concluded that  $H_0$  is rejected. This can be interpreted that there is the effectiveness of the scientific approach to problem based learning models to improve the ability to solve problems and learning outcomes of Natural Sciences in Primary Schools.

Table 5: Average results of the pre-test and post-test of student learning outcomes

|          |           |             |
|----------|-----------|-------------|
| Pre test | Post test | enhancement |
| 60.7     | 79,64     | 18.94       |

The average yield of the pretest and posttest results of learning of students is  $60.7 < 79,64$  things this shows that there is an increase of in the result of learning student after follow learning to approach the scientific models of problem-based learning.

Table 6 : Test Results *Paired Samples T Test* Results Learning Students

**Paired Samples Test**

|                        | Paired Differences |                |                 |   |        | t     | df | Sig. (2-tailed) |
|------------------------|--------------------|----------------|-----------------|---|--------|-------|----|-----------------|
|                        | Mean               | Std. Deviation | Std. Mean Error | 95% Confidence Interval of the Difference |        |       |    |                 |
|                        |                    |                |                 | Lower                                     | Upper  |       |    |                 |
| Pair 1 POSTES - PRETES | 18,929             | 12,046         | 2,276           | 14.258                                    | 23,600 | 8,315 | 27 | .000            |

Based on Table 6 the results of the test Paired Samples T Test data results of learning students obtained results sig (2-tailed ) is  $0.000 < 0.05$  then it can be concluded that  $H_0$  is rejected . It is can mean that there is the effectiveness of the approach of scientific models of problem based learning to Increase the ability to solve problems and the results of studying science at school basis.

The results of the study ya n g has been implemented a with the approach of the scientific models of problem-based learning can a make students more active in activities to learn to teach , particularly subject in improving the ability of students to solve problems and the results of learning of students . It is in accordance with the opinion of Sanjaya (2016) Problem Based Learning can be defined as the process of pe m belajaran the which emphasizes on activities to learn students to m emecahkan problems were encountered in science . Characteristics of problem based learning are focused on how to solve problems , responsibility for solving problems in students , and teachers only as support students in solving Reviews These problems (Eggen, 2012) . P emecahan problem is the process of thinking roomates Refers to the answer to a problem that involves the formation and selecting concepts that exist as well as the selection of alternative answers to the other ( Priansa , 2015)

The pretest and posttest were used to see the results of the students' problem solving abilities . Differences in scores on average throughout the students in the pretest and posttest shows that there is an increase of in the results of the test 's ability to solve the problem of students is  $68.46 < 80.00$  on the research that has been done is in line with research ( Amita , 2016) that the Scientific Approach to setting PBL is effective in empowering the ability of Science Process Skills . Student learning outcomes at the pretest and posttest data on student learning outcomes with an average value of student learning outcomes of 60.7. Posttest acquisition with an average student learning outcomes test score of 79.64. The average yield of the pretest and posttest results of learning of students is  $60.7 < 79,64$  things this shows that there is an increase of in the result of learning student after follow learning to approach the scientific models of problem-based learning . In the results of research by Destalia et al. (2014) the results of the research Showed that p Application of the model of PBM with methods of experiment can improve the skills of solving problems of students . The Paired Samples T test results also show the sig value .  $5 0:05 0000$  can be interpreted that between the pretest and posttest there are significant changes .

#### IV. CONCLUSION

Based on the results of the study are already in laksanakan , can be concluded that , k Capacity of solving the problem of students can be Increased by using the approach of the scientific models of problem based learning seen from an average grade at the time of the pretest at 68.46 and rose into 80.00 on the posttest . The scientific approach to the problem based learning models is effective towards improving the ability to solve problems and learning outcomes of students of science subjects in elementary school based on the results of paired samples t test, namely sig. 0,000 < 0.05.

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