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THE EFFECT OF PROBLEM BASED LEARNING AND MOTIVATION MODELS ON STUDENT LEARNING OUTCOMES IN MATHEMATICAL LEARNING IN CLASS IV ELEMENTARYSCHOOL

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ABSTRACT

Mathematics learning has so far not developed students' ability to solve problems. This can be seen from the difficulties of students in solving problems found in mathematics subjects. The purpose of this study in general is to examine the effect of PBL models and learning motivation on the mathematics learning outcomes of Class IV of SD Negeri 1 Batang Anai District, Batang Anai District, Pariaman Regency. The method used was a quasi-experimental design with 2x2 factorial design. The experimental and control groups were recruited by purposive random sampling. Data were analyzed by two-way variance t-test and analysis. The results showed that there were significant differences in learning outcomes between students taught with PBL models rather than students taught with conventional approaches, and between groups of students who were high and low motivated learning. There is no significant interaction between PBL models and learning motivation towards learning outcomes.

Keywords: Mathematics, Problem Based Learning, Motivations Model

INTRODUCTION

Education in elementary school (SD) was the first foundation for achieving success in further education. Education was carried out in the form of a learning process which was the implementation of the school curriculum. Education in Indonesia continues to be comprehensive in all fields, in the field of curriculum according to the

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times. The curriculum as the main guideline for education changes periodically to achieve perfection until now the implementation of the 2013 curriculum. The implementation of the 2013 curriculum in elementary schools (SD) has always undergone a change towards perfection. Finally, it was regulated by Permendikbud in 2016 Number 20 concerning Graduates' Competency Standards, Number 23 concerning standard assessment, number 24 concerning core competencies and basic competencies. In Permendibud number 22 year 2016 mandates that the implementation of learning in SD was strengthened by one of them was applying the learning model of problem based learning (Hermon, 2015; Permendikbud, 2016).

In connection with this, one way that can be taken by the teacher was in applying to mathematics learning so that the learning given was more meaningful and provides good learning outcomes for students so as to increase students' learning motivation with learning models of problem based learning (Hermon and Dalim, 2006). Learning model of problem based learning was one of the learning models that can activate and motivate students to learn. Problem based learning has a learning process posing problems to students. Problem Based Learning was also one of the learning models that processes through presenting, posing a problem, facilitating investigation and opening a dialogue with students, so as to train students in integrating knowledge and skills and applying them in relevant contexts (Hermon and Dalim, 2005; Sani, 2015).

The influence of the application of the problem based learning model on student learning in the learning process was also supported by the results of research conducted by Ratelit Tarigan (2017) where this study reveals that based on the application of the Problem Based learning model directed to one's activities and actions, each knowledge controls an interaction with experience. Without interaction with objects, one cannot build knowledge. In this case learning is a process operation, not figurative.

In addition to learning outcomes, the use of the Problem Based Learning model was also effective in influencing students' learning motivation in the learning process. This is based on the results of research conducted by African students in China by Jiang Chunsheng (2016) which shows that there is an influence of student learning motivation by using the Problem Based Learning model. Furthermore, the results of literary

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research, Zulaikha, Putra (2014) using the problem based learning model on science learning outcomes Students where the conclusions of the study stated that "Cognitive students' natural science learning outcomes that follow learning models Problem based learning can be said to be better than lecture learning "The advantages of applying the problem based learning model are increasing students' competencies in several ways, namely interest in learning and transferring concepts to problems.

Then refer to the Handika and Wangid (2013) study where Problem based learning has a better and more significant effect than conventional learning on mastering science concepts in terms of cognitive abilities, student science process skills in observing, grouping, measuring/counting, predicting, conclude and communicate elementary school students. Based on journals that are read related to the Problem based learning model can improve student learning outcomes from aspects of attitudes, knowledge and skills.

Based on observations in the field at SD Negeri Gugus 2 in Batang Anai Subdistrict in class IV, the researcher saw 1) the low motivation of students in mathematics learning due to the lack of wisdom and successful desires of students in solving the questions given by the teacher, 3) In the learning process the classroom environment is not yet conducive so that it does not carry out the proper teaching and learning process and is clarified by the lack of encouragement and needs of students in learning. This is evidenced when the teacher asks students to be silent and indifferent. tangible in the environment around students. In addition to having a low impact on student learning motivation, learning that only uses teacher-centered and unfavorable lecture methods is used as appropriate in learning because it does not improve students' ability to develop their own knowledge.

Based on the data obtained from student learning outcomes in fourth grade mathematics learning at SD Negeri Group 2 in Batang Anai, the average learning outcomes of Mathematics subjects are as follows: Average learning outcomes of students of SD Negeri Gugus 2 Batang Anai District Class IVA as follows: : Average student learning outcomes of SDN 08 Batang Anai is 60, SDN 09 Batang Anai on average 70, SDN 15 Batang Anai on average 63, SDN 22 Batang Anai on average 69, SDN 23 Batang Anai on average 65, SDN 24 Batang Anai on average 59, SDN 26

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Batang Anai on average 64, SDN 28 Batang Anai class IVA is 69 and IVB is 70, SDN 29 Batang Anai grade IVA with an average of 70 and IVB is 68, SDN 30 Batang Anai with an average of 59.

METHOD

This study is a quasi-experimental study to reveal a causal relationship by involving control groups in addition to the experimental group (Ibnu *et al*, 2003). This research was conducted on fourth grade students of SDN Group 2 in Batang Anai, Padang Pariaman Regency, in the 2018/2019 academic year. The research subjects were 46 students divided into 21 experimental class students and 25 control class students. The instruments used were learning motivation questionnaires and learning outcomes tests. Instruments in the form of questionnaires to obtain data on the level of student learning motivation and learning outcomes instruments in the form of objective tests, affective and psychomotor questionnaires are used to obtain data about mathematics learning outcomes. The data analysis technique used is by two-way variance t-test and analysis. Before the t-test and variance analysis he performed in the direction to test the hypothesis, the normality test and homogeneity test were first carried out. If the data is normally distributed and variants between homogeneous groups, then the hypothesis test can be continued. As the independent variable is the *pantun* writing skill and as the dependent variable is the PBL model and learning motivation.

RESULTS AND DISCUSSION

This study used class IV SDN 28 Batang Anai as a control class by obtaining conventional learning and class IV A SDN 28 Batang Anai as an experimental class with the Problem Based Learning model. The number of subjects in class IV was 21 students and in class IV A as many as 25 students. The results of hypothesis testing use a two-way variance t-test and analysis with a confidence level of 5% ($\alpha = 0.005$), the data from the research results are presented in the table. Based on the data and analysis, the discussion is sequentially described according to the purpose of this study.

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Problem Based Learning model (regardless of the level of learning motivation) is 88.85 or higher than the group of students who get conventional learning with an average of 79.75. Based on the results of data analysis it can be interpreted that the Problem Based Learning model is better than conventional learning. The results of data analysis also reinforce this. The results of data analysis are also strengthened by the results of testing the first hypothesis using the t test obtained that the resulting tcount is 8,077 with a significance level of 0,000. Because sig 0,000 is greater than 0.05, then H0 is rejected and H1 is accepted. This means that the learning outcomes of students who follow the Problem Based Learning model are better than using conventional approaches.

The results of the study using the Problem Based Learning model also strengthened the results of previous studies conducted by previous researchers about the use of the Problem Based Learning model, such as research conducted by Juliana (2017) suggesting that there were significant differences between the PBL group and traditional teaching groups. Yosico (2016) suggests that there is a significant effect of Problem Based Learning (PBL) learning model on student learning outcomes in dynamic fluid subject matter class XI Medan Panca Budi Private High School TP 2014/2015. Lamria (2018) suggests that there is an influence of the PBL model by using e-Learning for student outcomes.

The mean of learning outcomes in students taught with the Problem Based Learning model that has high learning motivation (= 88.85) is higher than the students taught with conventional approaches who have high learning motivation (= 79.75). This is reinforced by the results of the calculation of testing the second hypothesis using the t test obtained that the resulting tcount is 8,077 with a significance level of 0,000. Because sig 0,000 is greater than 0.05, then H0 is rejected and H1 is accepted. This means that the mathematics learning outcomes of students who have high learning motivation who follow the Problem Based Learning model are better than the mathematics learning outcomes of students who have high learning motivation who follow using a conventional approach.

The mean of learning outcomes in students taught with the Problem Based Learning model that has low learning motivation (= 85.88) is higher than the students

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taught with conventional approaches who have low learning motivation (= 72.76). This is reinforced by the results of the calculation of the testing of the third hypothesis using the t test obtained that the resulting tcount is 5.735 with a significance level of 0.000. Because sig 0,000 is greater than 0.05, then H0 is rejected and H1 is accepted. This means that the mathematics learning outcomes of students who have low learning motivation who follow the Problem Based Learning model are better than the mathematics learning outcomes of students who have high learning motivation who follow using a conventional approach.

The calculation results using the F test obtained fcount of 1.876 with Sig. 0.178. Thus the Sig. ≤ Value α (0.05). This means that Ho is rejected. In other words, there is enough evidence to state that there is no interaction between learning models and learning motivation towards learning outcomes. Based on the fourth hypothesis test, it was found that there was no interaction between the Problem Based Learning model and learning motivation towards learning outcomes. The absence of these interactions can be seen from the average mathematics learning outcomes through the Problem Based Learning model and conventional approaches. If the Problem Based Learning model and conventional approach are applied, the average mathematics learning outcomes for students who have high learning motivation tend to be higher when compared to students who have low learning motivation. Likewise, the average mathematics learning outcomes of students, both those who have high learning motivation and those who have low learning motivation, use the Problem Based Learning model and conventional approaches.

Based on the picture above, it can be seen that the learning model and student learning motivation do not intersect so that the learning model and student motivation tend to have no interaction between the two. Budiyono (2009) explains that the presence or absence of interactions can be expected from the graph of the profile of the independent variable. If the profile of the first and second independent variables does not intersect, there tends to be no interaction between the two variables. Figure 1 shows the average mathematics learning outcomes of students taught with the Problem Based Learning model is always higher than the average mathematics learning outcomes of students taught by conventional approaches. Students who have high learning

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motivation are better than students who have low learning motivation in the Problem Based Learning model and conventional approaches.

Learning motivation and learning models have their own influence on learning outcomes. Learning motivation encourages students to learn better, while the learning model is a pattern used in compiling, designing, delivering subject matter, organizing students to achieve optimal learning goals and mastery of concepts carried out by the teacher. The results of this study are in line with the research. The results of the study using the Problem Based Learning model also strengthened the results of previous studies conducted by previous researchers about the use of the Problem Based Learning model, such as research conducted by Lamria (2018) suggesting that there was an interaction between PBL using e-Learning and motivation for student outcomes.

CONCLUSION

Based on data analysis and discussion of research data that has been conducted, it can be concluded that the Problem Based Learning model influences students' mathematics learning outcomes. First, student learning outcomes taught by the Problem Based Learning model are better than the learning outcomes of students taught by conventional approaches. Second, the learning outcomes of students who have high learning motivation taught by the Problem Based Learning model are better than the learning outcomes of students who have low learning motivation taught by conventional approaches. Third, the learning outcomes of students who have high learning motivation taught by the Problem Based Learning model are better than the learning outcomes of students who have low learning motivation taught by conventional approaches. Fourth, there is no significant interaction between the Problem Based Learning model and student motivation towards learning outcomes.

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