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AFFECTING ABILITY TO SOLVE MATH STORY QUESTIONS STUDENTS 4th GRADE ELEMENTARY SCHOOL

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This research aims to determine the difference between the effects of the problem based learning model and those who do not use the problem based learning model on the ability to solve mathematical story questions in 4th grade students of SD Negeri Adiarsa Barat II in 2018/2019. This research is a quantitative research with quasi experimental research type. With the sample used in this study amounted to 30 students with a population of 60 students. Data collection techniques using the ability to solve mathematical questions story in the form of essay. In testing the validity of the test the ability to solve mathematical story questions from 10 items all declared valid. The reliability test results obtained r11 finished 0.843. Hypothesis testing results, with the t- sig test (2 tailed) obtained 0.037 <0.05 with a tcount of 2.140> t table 1.699 then Ho is rejected, then it means there is a difference in the final value of the ability to solve mathematical story questions between students who use the Problem Based Learning model with who do not use the Problem Based Learning model. The results of this research concluded that there was a difference in the influence of the Problem Based Learning model on the ability to solve mathematical story questions in 4th grade SD Negeri Adiarsa Barat II in the 2018/2019 academic year.

Keywords: PROBLEM BASED LEARNING, SOLVE MATH, ELEMENTARY SCHOOL

I. INTRODUCTION

Studying is very important. Because of studying, students become know something that they don't know before. As Skinner statement (Mustofa, 2015: 127) studying is an adaptation and adjustment of attitude which is shown by someone progressively. The success of students in studying is supported by some factors, there are internal and external. Internal factors such as intelligence, interest, motivation, cognitive ability and so on, while external factors such as family, school, and community environment.

One of the lower scores that has by students of elementary school is in mathematics subject. They think that mathematics is very difficult, so they become lazy to learn it. Sabandar (Asmara, 2016: 2) said that the main pillar of studying mathematics is problem solving. In mathematics learning, problem solving ability is very important because it needs a certain strategies. Mathematics learning trains students to solve the problems in an ability to solve mathematical story questions. Story questions are questions that are made in the form of a story and it usually involves daily activities of students.

Giving story questions make students have the experiences to solve the problems and they can correlate them to their real life. However, in general, story questions are very difficult to answer if students don't know the fit model to the questions, lack of understanding of students in answer the story questions so it makes a trigger of inability to finish it.

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To students can finish the questions, it needs positive communication between students and teachers, so all of the material can get well by students. One of based knowledge in school is counting. That story questions also cannot be determined directly, it should find the true questions first, then choose an arithmetic operation, and the last determine the right answer. In fact, there are so many students who cannot finish the questions, especially in mathematics subject, for example in SD Negeri Adiarsa Barat II. It was found some problems such as (1) the students were lazy to read the questions because it was shown in form of long story, (2) the students were difficult to understand the questions, so in the answer sheet there were not listed "diketahui" (was known) and "ditanyakan" (asked), (3) inability of students in choosing the formula which will they use to answer the questions, (4) the students cannot choose the final result in answering the questions, (5) lecture method still used by teachers, so that makes the students be a passive and lack of interest in mathematics subject especially in story questions, (6) the teachers were not given the chance to students to find their study concept like do the discussion with a group. Besides that, the result of a study of students was low, start from KKM score =70, the students just got a class average score of 60.

To solve the problem needs right handling and it is the teachers who should be creative to create a fun model in teaching so the students will enjoy, be active, and create the ability to solving the problems when they are studying. One of the learning models is *Problem Based Learning* model. According to Wena (Sutirman, 2013: 39), *Problem Based Learning is* a learning model which push the students to solve problems and correlate that into their real life. *Problem Based Learning* model is chosen because it has the privilege to develop students in answer the story questions, critical thinking and correlate them into their real life. Besides that, Asmara (2016: 2) said that *Problem Based Learning* has the potential to create the student's experiences become interesting and meaningful. This research aims to determine the different effects of *Problem Based Learning* between conventional methods on the ability to solve mathematical questions story in 4^{th} grade students of elementary school.

Because of a lack of ability to solve mathematical story questions which form of long description and push the students to understand, then it is chosen *Problem Based Learning* model to apply in class learning. *Problem Based Learning* is model that emphasizes of solve problems in groups to make student's way of thinking more develop. *Problem Based Learning* has some steps as follow: 1) the students are given some problems by teachers, 2) the students are directed to learn materials first, 3) the students do discussion in groups, 4) the students present of discussion's results, 5) the students do the activity learning evaluation that helped by teachers. *Problem Based Learning* model hopefully can develop the ability to solve mathematical story questions in 4^{th} grade students.

According to Polya (Laily, 2014:

58) the abilities which must have by students in solve story questions are 1) understanding questions with listed something which is known and asked, 2) arranging the result by choosing fit formulas and finishing it, 3) doing the plans by applying fit formulas before1) understanding questions with listed something which is known and asked, 2) arranging the plans by choosing fit formulas and finishing it, 3) doing the plans by applying fit formulas and finishing it, and 4) correcting result by explaining it based on original problems. If learning goes well, it will create a fun studying situation, so the students will enjoy, be active, and create the ability to solving mathematical story problems.

II. RESEARCH METHOD

This research was conducted in 4^{th} grade students SD Negeri Adiarsa Barat II. Jalan Cisokan Raya Perumnas Adiarsa, Adiarsa Barat, Karawang Barat 41313 on January until April 2019/2020 academic years.

This research is quantitative research with quasi experimental research

type. The design of the research is using Nonequivalent Control Group Design. The population of this research is all students of 4th grade in SD Adiarsa Barat II with amount of 60 students. The sample of research is students of 4th A and B grade with the amount of each grade are 30 students.

Data collection techniques used a test. This test is done to see the ability of students of SD Negeri Adiarsa Barat II to solve mathematical story questions. This test was done twice, those are *pretest* and *posttest*. At the beginning of class, *pretest* was given to students to measure the ability to solve mathematical story questions before using *Problem Based Learning* model. While p*osttest* was done to measure the ability to solve mathematical story questions after using *Problem Based Learning* model.

The data analysis technique of this research is using descriptive data analysis. The form of presentation of this technique is data themselves. Data from the *pretest* and *posttest* were some tests to solve mathematical story questions. In descriptive statistics used measure of central tendency and standard deviation. Measures of central tendency are mean, median, and mode. Measures of variability are variance, standard deviation, coefficient of variations, and mean deviation. The hypothesis of this research is, is there the difference between the effects of *Problem Based Learning and* those who do not use *Problem Based Learning* of the ability to solve mathematical story questions in students of 4th grade SD Negeri Adiarsa Barat II.

III. RESULT AND DISCUSSION

To know the effects of *Problem Based Learning* model there was a test first in the form of mathematical story questions that is *pretest*. At the next meeting, there was a learning class used *Problem Based Learning* method. In the last meeting, there was a *posttest* to know the result after used *Problem Based*

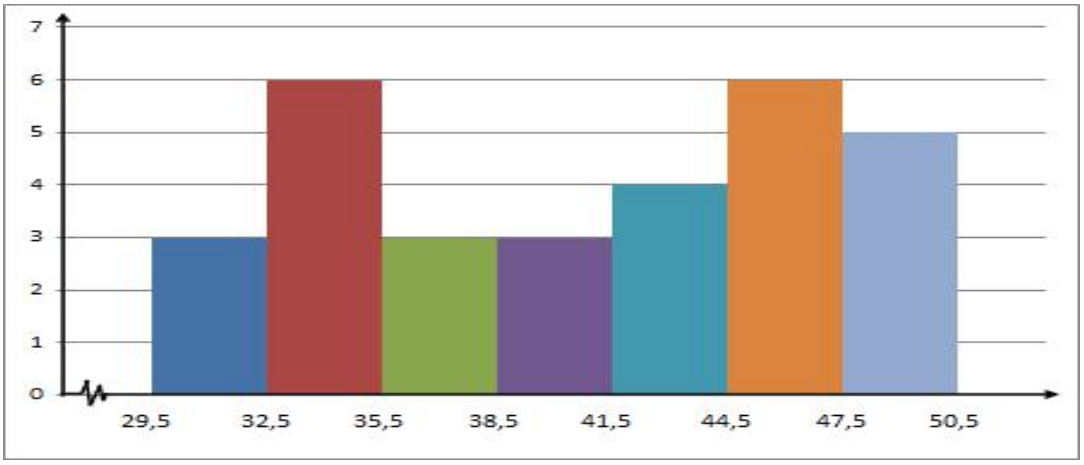
***Learning* method**

The following is a table of data on the result of Experimental Class Pretest:

The ability to solve mathematical story questions in class experimental *pretest* got maximum score 50, maximum 30, modus 45, median 41, mean 40,47, standard deviation 6,174, sum 1208, variance 38,08. Next, the result of the *pretest* is gotten from class with 30 amounts of students as respondents. With the amounts of a class is 6, interval 3 and range 20. Based on that data, the frequency distribution table can be presented as follow

Table 1. Experimental Class Pretest Frequency Distribution

Class Interval	F	Fk	Lower Class	Upper Class	Fr%
30 - 32	3	3	29,5	32,5	10,0
33 - 35	6	9	32,5	35,5	20,0
36 - 38	3	12	35,5	38,5	10,0
39 - 41	3	15	38,5	41,5	10,0
42 - 44	4	19	41,5	44,5	13,3
45 - 47	6	25	44,5	47,5	20,0
48 50	5	30	47,5	50,5	16,7
	30				100,0



Picture 1. Histogram Data Result of Experimental Class *Pretest*

Based on picture 4.1 those who get score 30-32 is 3 students, score 33-35 is 6 students, score 36-38 is 3 students, score 39-41 is 3 students, score 42-44 is 4 students, score 45-47 is 6 students and score 48-50 is 5 students.

Result Data of Experimental Class

Posttest

After conducting this research, the researcher did a result test who called as a *posttest,* to measure the ability of the student in an experimental class to solve mathematical story questions. *Posttest* data to know the ability to solve mathematical story questions, students were shown a table as below:

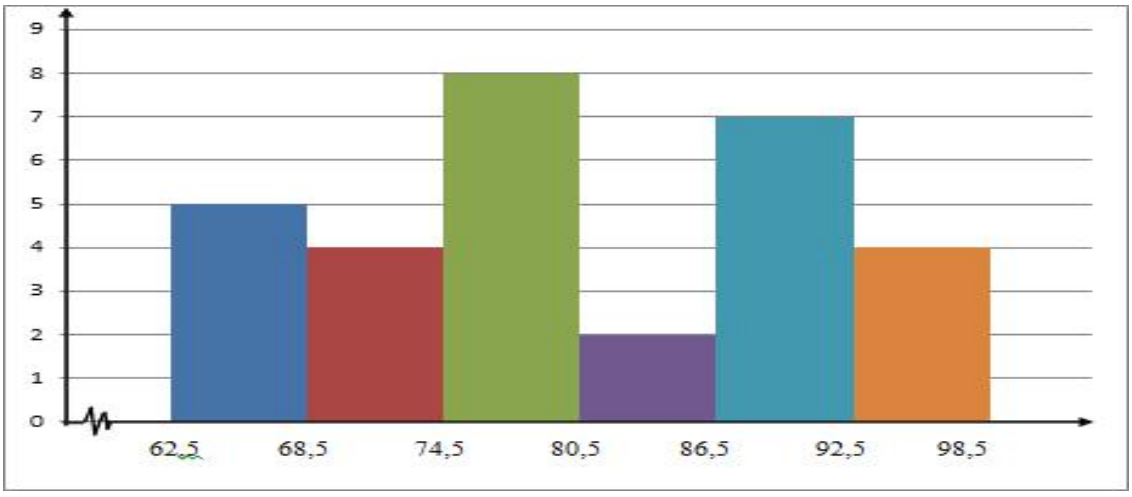
Data above showed that the ability to solve mathematical story questions for *posttest*, the experimental class gotmaximum 95, maximum 63, mode 87,5,

median 80, mean 80,10, standard deviation

9,593, sum 2395, variance 91,35. Next, the result of the *posttest* is gotten from class with 30 amounts of students as respondents. The amounts of a class is 6, interval 6 and range 33. Based on that data, the frequency distribution table can be presented as follows:

Table 2. Experimental Class *Posttest* Frequency Distribution

Class Interval	F	F k	Lower Class	Upper Class	Fr %
63 - 68	5	5	62,5	68,5	16,7
69 - 74	4	9	68,5	74,5	13,3
75 - 80	8	17	74,5	80,5	26,7
81 - 86	2	19	80,5	86,5	6,7
87 - 92	7	26	86,5	92,5	23,3
93 - 98	4	30	92,5	98,5	13,3
	30				100,0



Picture 2. Histogram Data Result of Experimental Class *Posttest*

Based on picture 4.2 those who get score 63-68 is 5 students, score 69-74 is 64students, score 75-80 is 8 students, score 81-86 is 2 students, score 87-92 is 7 students, score 45-47 is 6 students and score 93-98 is 4 students.

Result Data of Control Class *Pretest*

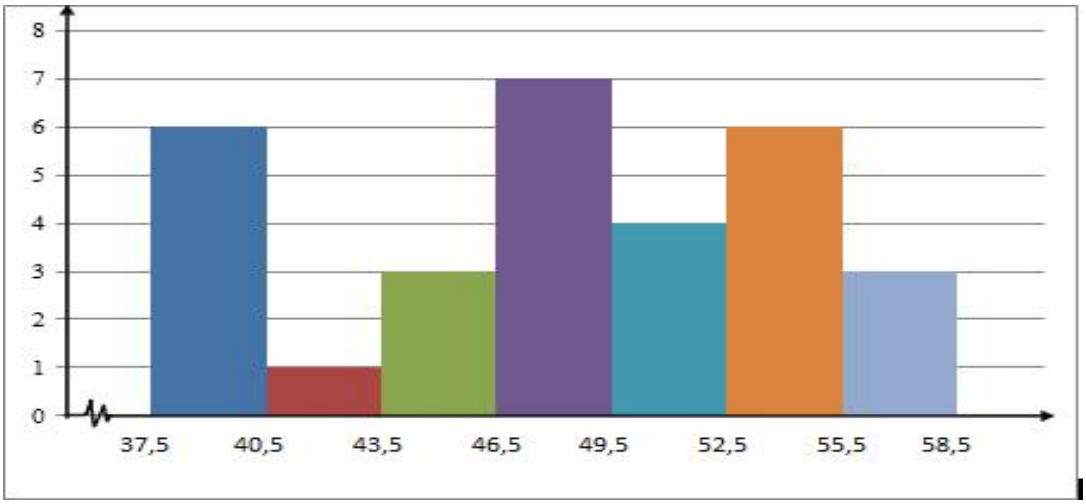
To know the initial ability of students to solve mathematical story questions, the control class *pretest* was gotten from the first meeting class. The following is a table of data on the result of Experimental Class Pretest:

The data above shown the ability to solve mathematical story questions in class experimental *pretest* got maximum score 58, maximum 38, mode 47,5, median 48,

mean 48,13, standard deviation 7,044, sum 1435, variance 38,68. Next, the result of the *pretest* is gotten from class with 30 amounts of students as respondents. With the amounts of a class is 6, interval 3 and range 20. Based on that data, the frequency distribution table can be presented as follows:

Table 3. Control Class *Pretest* Frequency Distribution

Interval Kelas			F	Fk	Lower Class	Upper Class	Fr %
38	-	40	6	6	37,5	40,5	20,0
41	-	43	1	7	40,5	43,5	3,3
44	-	46	3	10	43,5	46,5	10,0
47	-	49	7	17	46,5	49,5	23,3
50	-	52	4	21	49,5	52,5	13,3
53	-	55	6	27	52,5	55,5	20,0
56		58	3	30	55,5	58,5	10,0
			30				100,0



Picture 3. Histogram Data Result of Control Class *Pretest*

Based on picture 4.3 those who get score 38-40 is 6 students, score 41-43 is 1 student, score 44-46 is 3 students, score 47-49 is 7 students, score 50-52 is 4 students, score 53-55 is 6 students and score 56-58 is 3 students.

Data Result of Control Class Prestest

After conducting this research, the researcher did a result test who called as a *posttest,* to measure the ability of a student in the control class to solve mathematical story questions; those who do not use

Problem Based Learning

Posttest data to know the ability to solve mathematical story questions, students were shown a table as below:

The ability to solve mathematical story questions for the *posttest*, the control class got maximum 88, maximum 63,

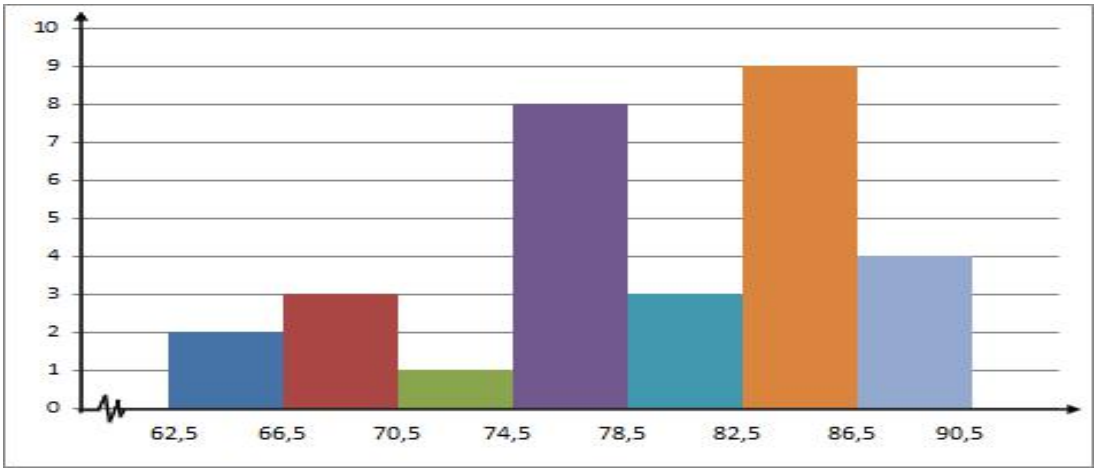
mode 75, median 80, mean 78,80, standard

deviation 7,044, sum 2358, variance 49,01. Next, the result of *posttest* is gotten from control class with 30 amounts of students as respondents. With the amounts of a class is 6, interval 4 and range 25. Based on that data, the frequency distribution table can be presented as follows:

Table 4. Control Class *Posttest* Distribution Frequency

Class Interval	F	F k	Lower CLass	Upper Class	Fr %
63 - 66	2	2	62,5	66,5	6,7

67 - 70	3	5	66,5	70,5	10,0
71 - 74	1	6	70,5	74,5	3,3
75 - 78	8	14	74,5	78,5	26,7
79 - 82	3	17	78,5	82,5	10,0
83 - 86	9	26	82,5	86,5	30,0
87 90	4	30	86,5	90,5	13,3
	30				100,0



Picture 4. Histogram Data Result of Control Class *Posttest*

Based on picture 4.4 those who get score 63-66 is 2 students, score 67-70 is 3 students, score 71-74 is 1 student, score 75-78 is 8 students, score 79-82 is 3 students, score 83-86 is 9 students and score 87-90 is 4 students.

To know the score of *pretest in* experimental class and control class from the population which normal or not in distribution, it needs normality test. Normality test research used *Shapiro Wilk* with helped by SPSS program 23,0 version with level $\alpha = 0,05$, using SPSS has high accuracy if the amount of data or sample which analysis is less than 50 (n,< 50). Result of normality data test in experimental and control class *pretest* that use SPSS program 23.0 version for Windows that presented in a table as follows:

Table 5. Score Result of Normality Test *Pretest*

	Shapiro-Wilk		
	Statistics	Df	Sig.
Experimental	0.937	30	0.075
Control	0.936	30	0.069

Table 4.9 above showed a normality test pretest score significantly with amount 0,075 it means score of sig is >0,05 and it includes to normal distribution of population, while the significant score of normality test control class with amount 0,069 it means score of sig is > 0,05 and it includes that score of *pretest* ability to solve mathematical story questions have a normal distribution (Jabarullah and Hussain, 2019).

Normality test was conducted to know is there *posttest* scores in experimental and control classes are from a population that has normal distribution or not. In this normality test, the research used *Shapiro Wilk* with helped by s*oftware* SPSS and real level α = 0,05, using SPSS has high accuracy if the amount of data or sample which analyze is less than 50 (n,< 50). This normality test was conducted to *pretest* and *posttest* scores from each group in the experimental and control class.

Tabel 6. Score Result of Normality Test *Posttest*

	Shapiro-Wilk		
	Statistics	**Df**	**Sig.**
Posttest control	0.945	30	0.121
Posttest experimental	0.934	30	0.064

Based on table 4.10 above showed significant score of normality test *posttest* score for control class with amount 0.121 it means score of sig is > 0,05 and it includes to normal distribution of population, while the significant score of normality test control in experimental class with amount 0,064 it means score of sig is > 0,05 and it includes that score of *posttest* ability to solve mathematical story questions have a normal distribution.

From the result of the experimental and control class *posttest*, both data are normal distribution so research data processing can move to the homogeneity of variance.

The homogeneity test was conducted to know the score from experimental and control class, does it have homogeneous or non-homogeneous variance. Testing homogeneity data used *Lavene's Test* with SPSS program 23.0 version.

Table 7. Homogeneity Test *Pretest* Score.

Levene Statistics	df 1	df 2	Sig.
0.252	1	58	0.617

Based on table 4.11 above there is P-value or significant score with amount 0,617. That score is higher than the chosen score, which is = 0,05. Because of P-value

> 0,617, it means the result score of experimental and control class *pretests* have the same variance (homogeny).

The homogeneity test was conducted to know the score from experimental and control class, does it have homogeneous or non-homogeneous variance. Testing homogeneity data used *Lavene's Test* with the SPSS program. Result of homogeneity test of experimental and control class *posttest* are presented on a table below.

Table 8. Result of Homogeneity Test *Posttest* Score

Levene Statistics	df1	df2	Sig.
3,621	1	58	0,062

Based on table 4.12 above there is P-value or significant score with amount 0,062. That score is higher than the chosen score, which is = 0,05. Because of P-value

> 0,062, it means the result score of experimental and control class *pretests* have the same variance (homogeny).

After whole data have been through normality and homogeneity test, it got the result distribution normal and homogeneous data, so the next hypothesis test used counting hypothesis, it used t test or *independent sample t test*. *Independent sample t test* is used to know the difference of ability to solve mathematical story questions with used *Problem Based Learning* model and do not used.

Table 9. Calculation Result of *Independent Sampl T Test*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
	Equal variances assumed	.521	.473	2.140	58	.037	.08075	.03773	.00522	.15627
	Equal variances not assumed			2.140	57.566	.037	.08075	.03773	.00521	.15628

Based on table 4.16 significant score (2-*tailed*) obtained 0,037 with level 0,05 with a t_{count} 2,140 > t_{table} 1,699, then Ho is rejected, then it means there is a difference in the final value of the ability to solve mathematical story questions between students who use the Problem Based Learning model with who do not use the Problem Based Learning model.

The results of the hypothesis test that was conducted by the researcher there was a difference between using the Problem Based Learning model with not using the Problem Based Learning model.

The result of this research significant score (2-*tailed*) obtained 0,037 with level 0,05 with a t_{count} 2,140 > t_{table} 1,699, then Ho is rejected, then it means there is a difference in the final value of the ability to solve mathematical story questions between students who use the Problem Based Learning model with who do not use the Problem Based Learning model.

IV. RESULT

The conclusion of this research conducted in SD Negeri Adiarsa Barat II there was significant effects to solve mathematical story questions between students who use the Problem Based Learning model with those who do not use the Problem Based Learning model. Proven by the result of the significant score (2-*tailed*) obtained 0,037 with level 0,05 with a t_{count} 2,140 > t_{table} 1,699, then Ho is rejected.

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