

The Effect of Based Learning Problem Model with Macromedia Flash to the Representation Mathematical Ability VII Grade Students of SMPN 1 Sidamanik

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Abstract

This research is aimed to know: (1) the effect of problem basic learning with macromedia flash to the mathematic representation ability and (2) the effect of problem basic learning model with macromedia flash to students' self confident. The kind of this research is quasi experiment. The population of this research is all VII Grade students of SMPN 1 Sidamanik. The sample of this research is VII-A Class as experiment class (36 students) and VII-C Class as control class (36 students). The instrument used consist of mathematic representation ability test and self-confidence questionnaire. The analysis is used by using 2 rutes Anava. The result of this research shows that: (1) there is significant effect of problem based learning by macromedia flash to the mathematic representation ability (2) there is significant effect of problem basic learning with macromedia flash to the students' self-confidence.

Keywords: Problem Based Learning, Macromedia Flash, Mathematic Representation Ability, and Self-Confidence

1. Introduction

The importance of mathematic representative ability can be seen from the standart of representation firmed by NCTM. NCTM (2000:1) firmed that learning program from pre-kindergarden up to 12 grade must possibly the students to (1) creating and using reprezentation to organize, record, and communicate the mathematism idea; (2)choose, applicate, and translate mathematic representation to solve the problem; and (3) using the representation to form phisical phenomenon, social, and mathematic phenomenon. Where as, according to Li (Zhe, 2012:63) "The structure of language in mathematical activities includes external communication such as written and oral representation of symbol, word, graphics, and images". Through the representation, the problem that is difficult first can be seen easier and simple, so the problem given can be solved easier.

The implementation of mathematism representation ought to have by all the students who learn mathematic. But in fact, the students' mathematism representation ability is still low. OECD (2015) concludes that PISA study that focuse to the reading litrary. Mathematic, and Science that shows Indonesia is the 10 lowest then 70 countries under of Singapore and Thailand. The result of this study shows that there needs a change of curriculum orientation that's not burdened the students with the content but to the aspect of essential ability.

Based on the mathematic representation ability, there is other important thing that must be attanted namely the psychology aspect of the students that can influence the students' success in finishing each mathematic problem. the psychology aspect is students' self-confidence. Self confidence becomes an importance aspect to the students' success because it is a self confidence in doing the task and choosing the good finishing, certain and effective. According to Basavanna (Goel & Aggarwal, 2011:90), "Self Confidence refers to an individual's perceived ability to act effectively in a situation to overcome obstacles and to get things go all right". The learning process is able to develop and recall the students' self confidence, able to face the difficulties in studying mathematic and in real life.

The design in acheiving mathematism representative ability and self confidence can be influenced from how is the teacher's way to choose the learning will be used. One of some learning model that can improve the students' mathematism representative ability and self confidence is problem based learning. According to Ajai (2013:123) that the students include in PBL shows the significant result and personally in studying and they regard their selves as the more active contributor group learning process and used better than the students who study with traditional method.

To improve learning effectivity, school is expected to use information technology and the communication like computer, demonstration aquipment, or another media. So that the students are more attractive and have self confidence to finish the problem given in PBL model, so that's used helped equipment by using media. The usage of the media as interactive multimedia as communicative point in presenting the material or problem, and helping to overcome some handicaps for the students to understand a problem that's given by the teacher in improving representation ability and self confidence in learning mathematic.

One of tSultan's research (2006) about interactive learning multimedia. This research developed interactive learning multimedia by using Macromedia Flash and Swishmax with the output as interactive learning multimedia. This learning is succed to develop to give the information that's usefull about basic theory far

sense. Having advantage than hard copy traditional out put. This multimedia learning is more flexybel, easy and interesting.

2. Method

This research used quantitative research approachment with experiment method in quasi experimental design form. Quasi experimental design form is a design having control group, but can not use to control the out variables that influence experiment implementation.

The research instrument that change mathematism representative ability is consist of 4 essay and self confidence questionnaire consist of 20 questions. After the test is done, next, data analysis is done as homogeneity test by using F test, the normality test by using kolmogorov-smirnov and hypotesis test by using 2 rutes Anava without interaction.

The prosedure of statistic test for two rutes of Anava without interaction is:

a. Making hypothesis in sentence essay

Hypothesis 1:

H_0 : there is no significant effect of based learning model problem with macromedia flash with the VII Grade Students of SMPN 1 Sidamanik.

H_1 : there is significant effect of problem based learning model with macromedia flash with the VII Grade Students of SMPN 1 Sidamanik

b. Hypothesis 2:

H_0 : there is no significant effect of problem based learning model with macromedia flash to the self confidence of VII Grade Students of SMPN 1 Sidamanik

H_1 : there is significant effect of problem based learning model with macromedia flash to the self confidence of VII Grade Students of SMPN 1 Sidamanik.

c. Making hypothesis in statistic form

d. Determining the real level

Real level: 0,5 or 5 %

e. The rule of the test

If $F_{hitung} \leq F_{tabel}_{SO}$ H_0 is received, it means there is no significant effect

If $F_{hitung} > F_{tabel}_{SO}$ H_0 is refused, it means there is significant effect

f. Counting the score of F_{hitung} and F_{tabel}

g. Comparing F_{hitung} and F_{tabel}

h. Decision

(Siregar, 2014:293)

3. Results and Discussion

3.1. The Description of Students' Mathematical Representation Ability

Representation ability test is essay test with Oppportunities material. Every question

Deputes 3 indicators of representative ability, namely: (indicator 1) reserve the data or information from a representation to the diagram representation, graficor table, (indicator 2) finishing the problem by including the mathematic expression, and (indicator 3) answering the question by using words or written text. The result of summary presentation from the students' achievement can be seen in this diagram.

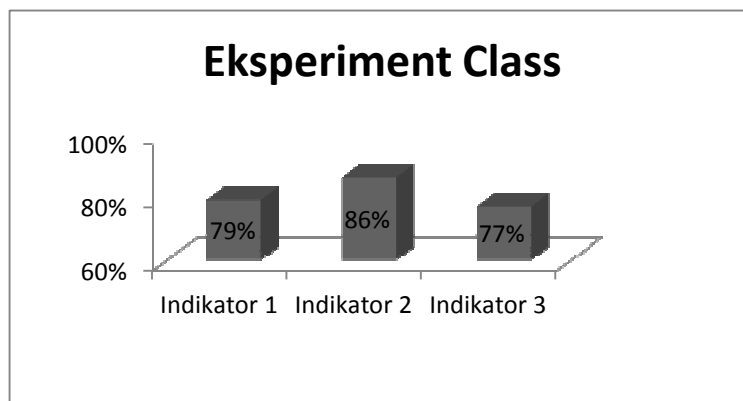


Figure 1. Representative Ability Diagram In Experiment Class

Based on figure 1, can be conclude that the most mastered indicator by the students for the mathematical representative ability by problem based learning with macromedia flash is indikator 2 namely equation

expression.

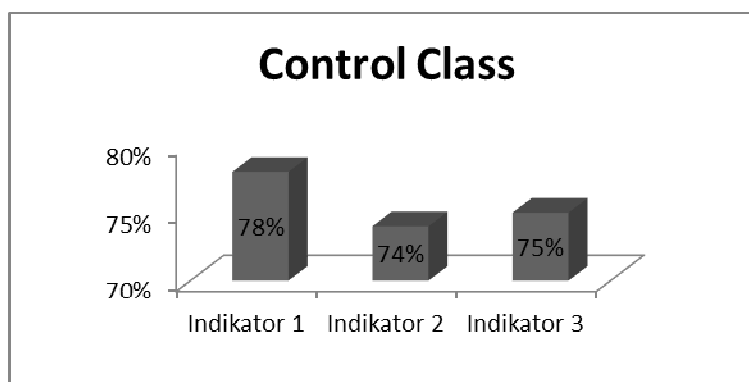


Figure 2. Representative Ability Diagram In Control Class

Based on figure 2, can be concluded that the indicator most mastered by the students to mathematical representative ability by problem based learning with macromedia flash is indicator 1 namely reserve the data as diagram, table, and graphic.

3.2. The Test Result of Mathematical Representative Ability and Students' Self-Confidence Questionary

The data is gotten from the score of mathematical representative ability test and self confidence questionnaire in experimen class or control class.

Table 1. The Data Description of Representative Ability and Students' Self Confidence both of Learning Group

Statistic	Learning			
	Problem Based Learning Model with macromedia flash		Usual Learning	
	Posttest	Questionary	Posttest	Questionary
N	36	36	36	36
Average	80,73	76,25	75,52	70,31
Stand. deviation	9,32	7,92	11,06	6,88

On table 1, we can see that the average of representative ability and self confidence of bot group of students that's studied with problem based learning with macromedia flash and usual learning.

3.2.1. Normality Test of Mathematical Representative Ability and Self Confidence

The formulations to test the data normality are:

H_0 : sample comes from the population that distributes normal.

H_a : sample comes from the population that distributes unnormal. S

The criteria of test that is used if the significance score is bigger that $\alpha = 0,05$ thus H_0 is received. The normality test of data used Kolmogorov-Smirnov test.

Table 2. The result of Normality test of Mathematical Representative Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LTE	,133	36	,105	,963	36	,259
LTC	,093	36	,200*	,952	36	,118

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Keterangan:

LTE : Last Test of Experiment Class

LAK : Last Test of Control Class

From table 2. From the data can be gotten problem based learning model wit macromedia flash experimen class and expository control class has bigger significancy score from 0,05 namely (0,200 > 0,05) and (0,105 > 0,05) thus from the data is gotten problem based learning model and usual learning normal distributed.

Table 3. The Result of Normality Test Self Confident Questionary
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SCE	,125	36	,170	,956	36	,167
SCK	,091	36	,200*	,974	36	,529

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Keterangan:

SCE : Self-Confidence Eksperiment Class

SCK : Self-Confidence Control Class

Table 3, Self-Confident Experiment Class and Control Class have bigger significacny from 0,05 namely (0,170 > 0,05) and (0,200 > 0,05) thus the self-confident data for problem basic learning model with macromedia flash and usual learning normal distributed.

3.2.2. Homogeneity Test of Mathematical Representative Ability Data and Self Confidence

Statistic hypothesis Formulation to test the homogeneity of both group of data is:

$H_0 : \sigma_1^2 = \sigma_2^2$: both of sample comes from the population that has homogen varians

$H_a : \sigma_1^2 \neq \sigma_2^2$: both of sample comes from the unhomogen varians

The criteria of the test used is if the significant score is bigger than $\alpha = 0,05$, thus H_0 is received.

Table 4. The Result of Homogeneity Test Mathematical Representative Ability Control Group and Experiment Group
Test of Homogeneity of Variances

KemampuanRepresentasi			
Levene Statistic	df1	df2	Sig.
1,568	1	70	,215

Based on table 4, giving significance score = 0,215 is bigger than $\alpha = 0,05$, thus H_0 is received. Therefore, both of sample come from the population that has homogen varians.

Tabel 5. The Result of Homogeneity Test Score of Self Confidence Questionary Control Class and Experiment Class
Test of Homogeneity of Variances

SelfConfidence			
Levene Statistic	df1	df2	Sig.
2,034	1	70	,158

Based on table 5 score (sig) = 0,158 is bigger than $\alpha = 0,05$, thus H_0 is received. Therefore, both of sample come from the population that has homogen varians.

3.2.3. Hypthesis Test

a. First Statistic Hypothesis

Testing the first research hypothesis that says is there any significant effect of problem based learning with macromedia flash to the students mathematical representation ability. The statistic tested are:

$$H_0: \beta_{11} = \beta_{12}$$

$$H_1: \beta_{11} > \beta_{12}$$

Note:

β_{11} : the effect of problem based learning with macromedia flash to the students' mathematical representation ability

β_{12} : the effect of usual learning to the students' mathematical representation ability

This is the out put accounting 2 rutes Anava with software SPSS version 19,0 statistic helping that shows in Table 6, namely:

**Table 6. ANAVA Test of Mathematical Representation Ability
 Tests of Between-Subjects Effects**

Dependent Variable:Representation Ability

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2077,937 ^a	5	415,587	4,783	,001
Intercept	306936,823	1	306936,823	3532,782	,000
KAM	1321,764	2	660,882	7,607	,001
Pembelajaran	296,446	1	296,446	3,412	,069
Error	5734,243	66	86,882		
Total	447239,264	72			
Corrected Total	7812,180	71			

a. R Squared = ,266 (Adjusted R Squared = ,210)

Based on the result of ANAVA 2 rutes in Table 6, thus we got:

$F_o(\text{Learning}) = 3,412$ with $p.\text{value} = 0,069 > 0,05$, or H_0 refused and received H_1 .

It means there is significant effect of problem based learning with macromedia flash to the students' mathematical representation ability.

b.The Second Statistic Hypothesis

testing the secondresearch hypothesis that significant by problem based learning with macromedia flash to the students' self confidence. The tested hypothesis are:

$$H_0 : \beta_{21} = \beta_{22}$$

$$H_1 : \beta_{21} > \beta_{22}$$

Note:

β_{21} : the effect of problem based learning model with macromedia flash to the students' self confidence

β_{22} : the effect of usual learning to the students' confidence

This is the output result 2 Rutes Anava by software SPSS version 19.0 statistic effect in table 7.

**Table 7. ANAVA Test of Students' Self-Confidence Siswa
 Tests of Between-Subjects Effects**

Dependent Variable:SelfConfidence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2806,619 ^a	5	561,324	22,064	,000
Intercept	268062,268	1	268062,268	10536,519	,000
KAM	1973,680	2	986,840	38,789	,000
Pembelajaran	286,459	1	286,459	11,260	,001
Error	1679,123	66	25,441		
Total	391135,938	72			
Corrected Total	4485,742	71			

a. R Squared = ,626 (Adjusted R Squared = ,597)

Based on result of ANAVA test on table 7, we can get:

$F_o(\text{learning}) = 11,260 > 0,05$, or H_0 refused and receive H_1 .

It means there is significant effect of problem based learning with macromedia flash to the students' self confidence.

4. Conclusion

Students' representation ability that is studied by problem based learning with macromedia flash is better than using usual learning. It's strengthen with the analysis result that shows there is the effect of this model to the students' mathematical representation ability. Beside that, students' self confidence alsoshows the better result in the class with problem based learning with macromedia flash compared with usual class. This research shows that there is effect problem based learning model with macromedia flash to the students' self confidence.

Therefore, problem based learning model with macromedia flash gives an effect to the students' cognitive and avvective ability in their mathematic class.

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