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# The Comparison Between Probing Prompting Learning Model and Problem Based Learning Model on Grade VIII Students' Learning Achievement SMPN 1 Cempa

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## ABSTRACT

This study aims to compare students' learning achievement between students who were taught mathematics by using probing prompting learning model and problem-based learning model in grade VIII SMPN 1 Cempa. The population of this research is the whole students of grade VIII SMPN 1 Cempa. The sample is conducted using random cluster sampling, where VIII<sub>1</sub> is applied problem-based learning model, and VIII<sub>2</sub> is applied probing prompting learning model. The instruments are consist of observation, questionnaires, and learning achievement tests. Data analysis techniques are descriptive analysis and inferential analysis by using SPSS 24 application for windows. Based on data analysis by using N-gain, both models are in the performing well category. The increasing average of probing prompting model class is 0.77 while problem-based learning model class is 0.76. The hypothesis testing is conducted using a t-test (independent sample test) with the level of significance  $\alpha = 0.05$  that compares the N-gain value from both experimental classes. As a result, the significant value is  $0.571 > 0.05$ , which means the P-value is greater than the significance level of 5%. Based on the inferential analysis,  $H_0$  is accepted, and  $H_1$  is rejected. Finally, it is concluded that there are no differences in increasing average result of students' learning achievement between students that taught mathematics by using probing prompting learning model and problem-based learning model in grade VIII SMPN 1 Cempa.

**Keywords:** Probing Prompting, Problem Based Learning, Learning Achievement, Mathematics.

## 1. INTRODUCTION

Education is a right and duty of every human being. Education is a conscious effort to change the attitudes and behavior of a person in an attempt to maturation itself through the learning process. The important factors in establishing the quality of education are teachers, curriculum, facility, and learning models that will be used.

Learning models determine the effectiveness of the learning process. This must be considered that an appropriate learning model can support the teacher in making students understand the subject present. This is also applied in mathematics which is considered a difficult subject by the students [1].

Mathematics is one of the important knowledge in facing the progress of science and technology in global competition. As one of the subjects taught longer at school, mathematics must be considered to ensure the students' interest. The government already gives more attention to improving the quality of education by perfecting the education curriculum [2].

Based on initial observation made by the researcher, found several problems in the class: teacher dominated the learning process, only used conventional model. Hence, the students are less motivated to develop thinking abilities. The process in class only needed students to memorize information; as a result, a student could not understand the subject. Teachers' innovative efforts in applying the learning

models that can stimulate students to be active in the class are still less.

Based on the problem, the probing prompting learning model can be an alternative model used. Probing prompting learning model is where the teacher gives a series of questions that lead students to find the answer by digging the previous knowledge. Furthermore, students also can construct their own concepts into new knowledge [3]. At the same time, problem-based learning is a student-centered model where students use real word problems to learn critical thinking and problem-solving skills. Because this model is a student center, students will be more active in learning [4].

### 1.1. Problem Formulation

Based on the description before, the formulated problem is as follows: Is there a significant difference between students' learning achievement that taught by using probing prompting learning model and problem-based learning model?

### 1.2. Research Objectives

Based on formulation, the research objective is to determine whether there is a significant difference between students' learning achievement that is taught by using probing prompting learning model and problem-based learning model.

### 1.3. Research Benefits

Based on the research objectives, the probing prompting learning model and problem-based learning model can be effectively used in the learning process as one of the innovative learning models. While the theoretical side of the research can be used for teachers, lecturers, and educators in general to improve the quality of human resources.

### 1.4. Effectiveness of Mathematics Learning

Learning activities involved more concentration and good organization. The effectiveness of the learning process must be a collaboration of school, parents, teachers, and students. Effectiveness means students had been accomplished the learning objectives given. The effectiveness of mathematics learning requires students to understand what students need to learn and support them to do well. Hewwit said that learning effectiveness involves the network of interdependencies associated with the learner [5]. Of course, every teacher must have strategies, a good learning model, and be supported by adequate skills.

### 1.5. Probing Prompting Learning Model

The probing prompting learning model is a model that allows the teachers to give several questions and guides students in solving problems so students will be able to construct concepts, principles, and knowledge [6]. This model also engages the students to be active in learning while the teacher has the biggest role to guide students to solve problems. The syntax of probing prompting are:

- Giving new situation
- Formulating and discussion
- Asking question
- Answering question
- Giving a hint relating to the question
- Asking final question

### 1.6. Problem Based Learning Model

Problem based learning is a teaching model that focuses on students in their involvement in the learning process. Problem-based learning shows that reflection and communication, and collaboration skills also require reflection from several perspectives [7]. Problem-based learning allows students to research, integrate theory and practice, and apply knowledge and skills to develop a solution to the defined problem. The keywords of Problem Based Learning are: (1) unresolved, structure problem that will give some thoughts about cause and solution, (2) student centered approach, in which students determine what they need for learning, (3) teachers as facilitators and tutors, (4) authentic problem and reflects the professional practice [8].

Barrows also show that learning in Problem Based Learning environment must be integrated from some sciences, so the students learn and integrate the information from some sciences that connect with understanding and solving the problem. Essentially, problem-based learning is a learning approach in which students work together to solve a complex problem. There are some steps of Problem Based Learning as follows:

- Students orientation to the problem
- Organize students
- Individual and group research guide
- Develop and present the work
- Analyze and evaluate the problem-solving process

### 1.7. Mathematics Learning Achievement

Mathematics learning achievement can show the competency of students in mathematics subjects. Students have to achieve specific goals and objectives

given in mathematics. The achievement can be seen by the process or the result using a test given by the teacher to measure the students' learning achievement.

**1.8. Hypothesis**

There is a significant difference between students' learning achievement taught using probing prompting learning model and problem-based learning model on grade VIII in SMPN 1 Cempa.

**2. RESEARCH METHODS**

This research used quantitative research with quasi-experimental by using two experimental groups, i.e., Probing Prompting and Problem Based Learning groups as control class.

**2.1. Research Variable**

There were two independent variables and dependent variables involved in this research. The independent variables were learning models, while students' learning achievement was dependent.

**2.2. Data Collection Technique**

This research used two kinds of data collection techniques, those were pretest before treatment and posttest after treatment.

**2.3. Research instrument**

The instrument used in this research was an essay test to measure students' learning achievement and an observation sheet to determine that the teacher followed the models' syntax well.

**2.4. Population and Sample**

The population of this research was all students of grade VIII in SMPN 1 Cempa consists of 7 parallel classes. The sample was taken by using random cluster sampling of 2 classes from 7 classes. VIIIA was treated with a probing prompting model, while VIIC was treated with a problem-based learning model.

**2.5. Data Processing Techniques and Analysis**

Descriptive analysis is conducted by comparing the value of the statistic of the pretest and posttest. Data processing test was done by comparing the pretest and posttest score result using N-gain. Testing the hypothesis was used independent sample t-test analysis. Using t-test to determine whether there were any significant differences between the two models.

The analysis was performed by using SPSS 24 for windows software at a 5% significant level.

**3. RESULT AND DISCUSSION**

**3.1. Data Test of Probing Prompting Learning Model Application**

Data test of probing prompting learning model application consist of pretest and posttest given. Both groups' results are presented in Table 1.

**Table 1.** Data Test of Probing Prompting Learning Model Application

Statistics	Statistics Value	
	Pretest	Posttest
Sample Size	29	29
Range	32	12
Minimum value	6.67	76.00
Maximum value	38.67	88.00
Mean	24.87	82.99
Standard Deviation	7.78	4.15
Variance	60.60	17.23

Based on the descriptive statistical data analysis result as shown in Table 1, the lowest score in the pretest is 6.67, while the posttest shows 76.00. On the other hand, the highest is 38.67 in the pretest and 88.00 in the posttest.

**3.2. Data Test of Problem Based Learning Model Application**

Data test of problem-based learning model application consists of pretest and posttest. Both groups' results are presented in Table 2.

**Table 2.** Data Test of Problem Based Learning Model Application

Statistics	Statistics Value	
	Pretest	Posttest
Sample Size	30	30
Range	34.67	30.67
Minimum value	8.00	64.00
Maximum value	42.67	94.67
Mean	26.80	82.27
Standard Deviation	9.68	9.17
Variance	93.73	84.24

Based on the descriptive statistical data analysis result as shown in Table 2, the lowest score in the pretest is 8.00 while the post-test shows 64.00. On the other hand, the highest is 42.67 in the pretest and 94.67 in the posttest.

### 3.3. N-Gain

Data of improvement of students' learning achievement for both models were obtained from the pretest and post-test converted into the normalized gain formula as shown in Table 3.

**Table 3.** N-Gain

Score	Category	Frequency	
		PP	PBL
$g \leq 0.30$	Low	0	0
$0.30 < g \leq 0.70$	Medium	1	6
$g > 0.70$	High	28	24

Based on Table 3. 96.55% of students in probing prompting class in a high category while medium showed 3.45% of students. Not much difference from problem-based learning class shown 80% in high category and 20% in the medium category. Both models Probing Prompting and Problem Based Learning, also revealed no student in the low category.

### 3.4. Hypothesis Test Result

Before the hypothesis test was conducted, the assumption test was performed include the normality test and homogeneity test. Normality test was conducted by using a one-sample Kolmogorov Smirnov test to test whether the data were normally distributed and, as a result, concluded that the data were normally distributed. While for homogeneity, test results showed that all data obtained in this research was homogeny. The data is normally distributed, and homogeny can be continued to the hypothesis testing.

Testing the hypothesis by comparing the N-gain from both treatment classes using an independent sample t-test with a 5% significance level. The result is presented in Table 4.

**Table 4.** Independent Sample t-test Result

	Statistics	Mean Difference	Sig (2-tailed)
N-Gain	0.578	0.01221	0.571

Based on Table 4. it can be seen that the value of sig (2-tailed) was obtained 0.571, which is greater than 0.05. By comparing the sig (2-tailed) and the significance level, it is shown that  $H_0$  is accepted and  $H_1$  is rejected, which means there is no significant difference between students' learning achievement that taught by using probing prompting learning model and problem-based learning model on grade VIII in SMPN 1 Cempa. This is because the result of the descriptive analysis shows that both models Probing Prompting and Problem Based Learning are effectively improve the students' learning achievement.

## 4. CONCLUSION

Based on the result of data analysis and discussion previous, can be concluded several things as follow:

- Probing Prompting Learning Model and Problem Based Learning Models effectively increase the students; learning achievement on grade VIII in SMPN 1 Cempa.
- There is no significant difference between students' learning achievement that is taught using the Probing Prompting Learning Model and the Problem Based Learning Model on grade VIII in SMPN 1 Cempa.

## AUTHORS' CONTRIBUTIONS

Nur Awaliah carried out the research and compiled the article while Wahidah Sanusi and Aswi as supervisors in the implementation and preparation of the articles.

## ACKNOWLEDGMENTS

The authors thanked and praised everyone who helped research until they completed the article successfully.

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