

The Influence Problem-Based Learning Model with Scientific Approach by Using Media Prezi on Learning Outcomes

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ABSTRACT

This study aims to determine the influence of applying the problem-based learning model with a scientific approach by using media Prezi to mathematics learning outcomes of 8th-grade students at SMP Negeri 1 Sungguminasa. It is quantitative research with a quasi-experimental method and a non-equivalent control group design. The population in this study was students in grade 8 at Negeri 1 Sungguminasa, divided into 11 classes. Two classes were selected as the experimental and control classes using a simple random sampling method. The data were collected through observation sheets and learning achievement tests. Then, the data were analyzed by occupying descriptive analysis and inferential analysis. The results of the descriptive study showed that the average score of learning outcomes of students taught using a problem-based learning model with a scientific approach assisted by media Prezi was 78.7, while the average score of learning outcomes of students taught using another method was 72.19. The results of the inferential analysis showed a difference in average between learning outcomes of students taught using the problem-based learning model with a scientific approach assisted by media Prezi and those taught by another learning model where the obtained t value > t table implies H₀ was rejected. So, it can be concluded that applying a problem-based learning model with a scientific approach assisted by media Prezi on the mathematics learning outcomes of the 8th-grade students at SMP Negeri 1 Sungguminasa.

Keywords: Learning Outcomes, Problem Based Learning (PBL), Scientific Approach, Media Prezi.

1. INTRODUCTION

Education is a system consisting of several components. These components work together to achieve educational goals [6]. Through education, humans are expected to think, act, and appreciate to think, act, and appreciate quality education so that humans are required to obtain high education. Education is a process of attempting to mature humans by changing the behavior and attitude of someone or a group of people through teaching and training efforts, processes, methods, and an act of educating [1].

One aspect in education that can improve the quality of human resources is mathematical education. In improving the quality of education in Indonesia, the government has made improvements,

such as curriculum. The curriculum has experienced several changes and modifications in each of its development. Based on Act Number 20 of 2013 regarding the National Education System, the curriculum is a set of plans and settings regarding the goals, teaching materials, and methods used as guidance for implementing learning activities to achieve the educational goals. In other words, the curriculum is teacher guidance in implementing learning activities.

Mathematical education is currently based on the curriculum 2013, an applicable curriculum in the Indonesian educational system, upgraded from curriculum 2016 or called Education Unit Level Curriculum (KTSP). The learning in curriculum 2013 uses several learning models applied.

Generally, there are four models: Discovery Learning, Inquiry, Problem-Based Learning, and Project-Based Learning. The learning model 2013 aims to enable students to learn independently so that the learning process is no longer teacher-centered [5].

Based on the preliminary observation in SMP Negeri 1 Sungguminasa that has implemented curriculum 2013, the learning process was still teacher-centered. It did not occupy learning media so that the students tended to be less active in the learning process. In addition, in the interview results with 8th-grade students in SMP Negeri 1 Sungguminasa, Gowa Regency, it was obtained that mathematics was a complex subject for students. Meanwhile, an interview with one of the mathematic teachers showed that the mathematics learning outcomes in that class were still relatively low. MCC's score in mathematics subject stated by the school itself was 75. Internal and external factors might cause the low mathematics score of students. Internal factors included motivation, physical conditions, etc., while external factors were the learning process in the class. The learning process in the course was still less varied and tended to be teacher-centered. One of the attempts to overcome these problems is by implementing a student-centered learning model following the current learning curriculum. Moreover, we can also use learning media that can make students interested in mathematics learning so that students can be active in understanding problems in the learning process and improve students' mathematics learning outcomes. One of the learning models and media used by the researcher to overcome the issues is Problem Based Learning with Prezi media-assisted scientific approach.

One of the learning models that can be applied with learning media is the Problem Based Learning model with a scientific approach. This learning model is one of the innovative learning models which can provide active learning conditions to students. In addition, this learning model can be used with Prezi media. Prezi, the software that can be used for presentations, can assist teachers in providing the subject material so that the learning process can be more effective and efficient.

Several results of studies by many other researchers have shown that learning using problem-based learning and pair checks assisted by Prezi is effective and efficient for the learning process [3, 5].

2. RESEARCH METHODS

This study is Quasi-Experimental research with a non-equivalent control group design. This study involved two groups, namely, a treated group as the experimental class and an untreated group as the control class. The experimental class and control class were performed pre-test given before the application of the learning model and post-test shown after the application of the learning model [2]. The research design is illustrated in Table 1 [7].

Table 1. Research design

Group	Pre-Test	Treatment	Post-Test
Eksperimen	T1	X	T2
Control	T1	Y	T2

Notes:

X = Problem Based Learning model with scientific approach assisted by Prezi Media.

Y = Conventional Model without the assistance of media

T1 = The results of Pre-Test on experimental and control classes

T2 = The results of Post-Test on experimental and control classes

The population of the study was all 8th-grade students in SMP Negeri 1 Sungguminasa, Gowa Regency. The sample selection method used was a simple random sampling technique. This technique is applied since each individual is homogeneous, implying that samples can be selected from any group [7]. As a result, class VIII-D and class VIII-I were chosen as the experimental class and the control class, respectively. In this study, instruments occupied were observation sheets and tests in the form of essay questions. The data obtained were then analyzed using descriptive analysis technique and inferential analysis technique.

3. RESULTS AND DISCUSSION

3.1 Learning outcomes of students taught using Problem Based Learning model with scientific approach assisted by Prezi media.

The mathematics learning outcomes of students taught using the Problem Based Learning model with a scientific approach assisted by Prezi in the experimental class are given in Table 2.

Table 2. Descriptive analysis of students’ learning outcomes in the experimental class

Statistics	Statistical Value	
	Pretest	Posttest
Lowest Score	30	67
Highest Score	60	90
Average (x)	41.93	78.7
Standard Deviation (SD)	9.5	7.21

The student learning outcomes were divided into four categories, low, moderate, high, and very high, as shown in Table 3.

Table 3. The categories of learning outcomes in the experimental class

Mastery Level	Category	Pretest		Posttest	
		Frequency	percentage	Frequency	percentage
21-40	Low	18	51.4286%	-	-
41-60	Medium	17	48.5714%	-	-
61-80	High	-	-	24	68.5714%
81-100	Very High	-	-	11	31.4286%
Total		35	100	35	100

Table 3 above shows the mathematics learning outcomes of students in the experimental class. Based on the pretest score, it can be seen that 18 students (51.4286%) were in a low category and 17 students (48.5714%) were in the moderate category. Meanwhile, the mathematics learning outcomes of students based on the post-test scores showed that no students (0%) were in the low and moderate category, 24 students (68.5714%) were in the high category, and 11 students (31.4286%) were in the very high category.

Thus, it can be concluded that mathematics learning outcomes of students taught using Problem Based Learning model with a scientific approach assisted by Prezi media in 8th-grade of SMP Negeri 1 Sungguminasa showed the difference of the average scores between before after the application of the learning model.

3.2 Learning outcomes of students who are not taught using the problem-Based Learning model with a scientific Approach Assisted by Prezi Media

The mathematics learning outcomes of students who are taught not using the Problem Based Learning model with a Scientific Approach Assisted by Prezi Media towards the mathematics learning outcomes can be seen in Table 4.

Table 4. Descriptive analysis of student learning outcomes in the control class

Statistics	Statistical Value	
	Pretest	Posttest
Lowest Score	25	62
Highest Score	60	85
Average (x)	41.21	72.19
Standard Deviation (SD)	10.01	7.01

The students’ learning outcomes were divided into four categories, low, moderate, high, and very high, as shown in Table 5.

Table 5. The categories of mathematics learning outcomes in the control class

Mastery Level	Category	Pretest		Posttest	
		percentage	Frequency	percentage	Frequency
21-40	Low	16	45.7143%	-	-
41-60	Medium	19	54.2857%	-	-
61-80	High	-	-	29	82.8571%
81-100	Very High	-	-	6	17.1429%
Total		35	100	35	100

Based on the table above, it can be seen that the average score of the mathematics learning outcomes of students in the control class was in the moderate category with a percentage of 54.2857%. This was because more than half of all students still experienced difficulties in answering the questions given. Students did not learn the materials they had learned and did not do the assignments given. In addition, it was found that students who were not taught using the Problem Based Learning model with a scientific approach without Prezi media tended to be less active in the learning process compared to those in the experimental class.

Therefore, it can be concluded that the learning outcomes of students who do not use the Problem Based Learning model with a scientific approach without Prezi media were in the moderate category. Thus, student learning outcomes in the experimental class are better than those in the control class.

3.3 The Difference between Mathematics Outcomes of Students Taught Using Problem Based Learning Model with Scientific Approach Assisted by Prezi Media and Conventional Model without learning media.

From the results of data analysis showing that the data were normally distributed and homogeneous, the analysis was then continued by testing the difference in the average between the learning outcomes of students in the experimental class and the control class by occupying an independent sample t-test. It was found that the independent sample t-test obtained a significance value (2-tailed) of $0.003 < 0.05$. Therefore, it can be concluded that there is a difference in the average between learning outcomes of the students taught using the Problem Based Learning model with a scientific approach assisted by Prezi media and a conventional model.

3.4 The Influence between Problem Based Learning Model with Scientific Approach Assisted by Prezi Media and Conventional Model Without Learning media on Mathematics Learning Outcomes

Based on the quantitative and qualitative statistics analysis in the experimental class, it was shown that applying the Problem Based Learning model with a scientific approach assisted by the Prezi model affects students' mathematics learning outcomes. This occurred because students taught using Problem Based Learning with a scientific approach assisted by Prezi media were more active and enthusiastic in learning activities than those taught using the Conventional Model. Students were excited at every learning stage carried out. Furthermore, students were also more active in solving mathematics problems, and together with their respective groups, they comfortably shared their opinions with their friends.

Based on the discussion above, it can be concluded that there is an influence of the Problem Based Learning model with scientific approach assisted by Prezi media on the mathematics learning outcomes of 8th-grade students in SMP Negeri 1 Sungguminasa.

4. CONCLUSION

Based on the results of the previous study and discussion, it can be concluded that:

- 4.1 A problem-based learning model with a Scientific Approach Assisted by Prezi media can improve students' mathematics learning outcomes.
- 4.2 There is a difference between the average student learning outcomes using the Problem Based Learning model with a scientific approach assisted by Prezi media and the conventional Model without learning media.

- 4.3 There is an influence of the Problem Based Learning model with scientific approach assisted by Prezi media on mathematics learning outcomes.

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