

## The Influence of Learning Model Problem Based Learning in Group Investigation Against Learning Outcomes And Activeness Basic Computers and Networks

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### ABSTRACT

This study aims to find out (1) whether there are differences in learning outcomes in the application of learning models Problem Based Learning in Group Investigation with conventional learning models; (2) Are there differences in student learning activeness in the application of learning models Problem Based Learning in Group Investigation with conventional learning models (3) Is the application of learning models Problem Based Learning in Integrated Group Investigation more effective than conventional learning. This study used the quasi-experimental design method with a pretest-posttest control group design model. The population in this study were students of X Axioo class and X RPL B of SMK Negeri 5 Surakarta. The sample used was 70 people. The sampling technique used is total sampling. Data collection techniques using pretest-posttest and observation sheet. The data analysis technique used is balanced test, normality test, homogeneity test, and hypothesis test. The results of the study are as follows. First, there are differences in learning outcomes between learning models of Problem Based Learning in conventional Group Investigation and Learning. Second, there are differences in learning activeness between learning models of Problem Based Learning in conventional Group Investigation and Learning. Third, the effectiveness of the learning model of Problem Based Learning in Group Investigation is higher than conventional Learning in improving learning outcomes.

**Keywords:** Problem Based Learning, Group Investigation, Conventional Learning, Learning Outcomes, Activity

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## 1. INTRODUCTION

Vocational High School (SMK) is a junior secondary education that has the main goal of preparing a highly disciplined, skilled, and professional workforce with the demands of the world of work. These objectives are stated in the National Education System Law Article 15 where the specific objectives of Vocational Schools are to prepare students to become productive human beings, able to work independently, fill job vacancies in the business world and the industrial world as middle-level workers in accordance with competencies in their chosen expertise program. One effort to make it happen is to improve the quality of learning.

The learning process during observation at the SMK N 5 Surakarta Class X on Basic Computer and Network subjects are using conventional teachers, giving assignments, and asking questions. It is expected that with the learning process, students can play an active role. The reality in the field shows that the level of activity and student learning outcomes are not optimal. The lack of student activity can be seen when the learning process takes place, it is caused by the learning model used by the teacher is still less varied, dominant with conventional methods (lectures). Conventional methods (lectures) are the main choice in learning because without that method students find it difficult to understand learning material and the limitations of learning

facilities and infrastructure. The less varied model does not directly involve student activities. Whereas student learning outcomes are not optimal as indicated by the number of students whose values have not yet reached the Minimum Graduation Criteria (KKM), 76. Students are impressed that the teacher is the only source of learning (teacher-centered learning), and the model of Problem Based Learning in Group Investigation which is considered to increase activity so that student learning outcomes become optimal (Observation, 2019).

Problem Based Learning (Problem Based Learning) combined with Group Investigation will add independence in a group atmosphere. Students in the group have the responsibility to conduct an investigation that answers the problems faced, communicating the results of the investigation in the discussion. So in the Group Investigation, each individual is required to be active during learning. This is quite effective in increasing participation and achieving learning outcomes (Prastyaningtyas & Widiawati, 2018).

Based on the background of the problem as described earlier, the authors are interested in conducting research with the title "The Influence of Learning Model Problem Based Learning in Group Investigation on Learning Outcomes Viewed from the Activity of Computer Subjects and Basic Networks of Class X Students in Surakarta Vocational High School".

## 2. RESEARCH METHOD

The method used in this study is the Quasi-Experimental Design method, which is experimental research which is the development of True Experimental Design. This design is almost the same as the Pretest-Posttest Control Group Design, except that in this design the experimental group and the control group were not chosen randomly. In this study, the population used was class X students of SMK Negeri 5 Surakarta with a total of 70 students consisting of 2 classes. Class X Axioo which amounted to 35 students and class X RPL B totaling 35 students. While the sampling in this study used total sampling by using the entire population into samples, namely some control classes and some classes with experiments. Data collection techniques used in this study include the test of learning outcomes, questionnaire, and observation.

## 3. RESULT AND ANALYSIS

So that the results can be accounted for, the data analysis in this study must meet the test analysis prerequisites. The analysis prerequisite test in this study consisted of a Balance Test, a Normality Test, and Homogeneity Test. The test results show a sig value > 0.05. Then testing can be done hypothesis. Hypothesis testing is done by using a two-way analysis of variance to find out there is whether or not the influence of interaction between variables. The basic decision-making hypothesis test is if the value of Sig. < 0.05, which indicates an influence or interaction.

### 3.1. RESULT

#### Testing the First Hypothesis

H<sub>0</sub> : There were no differences in learning outcomes in the application of the Problem Based Learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of State Vocational High School 5 Surakarta in Basic Computer and Network Subjects.

H<sub>1</sub> : There are differences in learning outcomes in the application of the Problem Based Learning learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on Basic Computer and Network subjects.

Testing the first hypothesis is used to determine the differences in student learning outcomes in both classes. This test is carried out using the t-test with an error level of 0.05. The decision to test the first hypothesis is that the hypothesis is accepted if Sig (2tailed) < 0.05 and the hypothesis is rejected if Sig (2tailed) > 0.05.

Table 1 Example of Format for Tables (Source)

Class	N	Sig	$\alpha = 5\%$	Criteria	Information
Class Eksperimen	35	0,000	0,05	0,000 < 0,05	H <sub>0</sub> rejected

Class Kontrol	35				H <sub>1</sub> accepted
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Based on Table 1 the results of the first Hypothesis Test with Sig <0.05 the result is Sig. 0,000 <0,05 Thus, H<sub>0</sub> is rejected and H<sub>1</sub> is accepted, so it can be concluded that there are differences in learning outcomes using Problem Based Learning learning models combined with Group Investigation and conventional learning for students in Basic Computer and Network subjects.

### Testing the Second Hypothesis

H<sub>0</sub> : There is no difference in student learning activeness in the application of the Problem Based Learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks.

H<sub>1</sub> : There are differences in student learning activeness in the application of the Problem Based Learning learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks.

Testing the second hypothesis is done to determine the differences in the activity of students in the experimental class and the control class using the test -t (independent sample t test), the following are the results of testing the activeness of students in the experimental class and control class

*Table 2 Example of Format for Tables (Source)*

Variansi	Sig	Criteria	Decision	Information
Activity	0,000	< 0,05	There is influence	H <sub>1</sub> accepted

Based on table 1 shows the value of sig 0,000 <0,05, then h<sub>0</sub> is rejected and h<sub>1</sub> is accepted. So that it can be concluded that there were differences in learning activeness in the application of the Problem Based Learning learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks.

### Testing the Third Hypothesis

H<sub>0</sub> : There was no increase in learning outcomes in the application of the Problem Based Learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks.

H<sub>1</sub> : There is an increase in learning outcomes in the application of the Problem Based Learning learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks.

Testing the third hypothesis is done to determine the increase in learning outcomes in the experimental class that applies the Problem Based Learning model combined with Group Investigation. Testing the third hypothesis is done using the gain test. The results of the gain test calculation are as follows:

*Table 3 Example of Format for Tables (Source)*

Variansi	Class Eksperimen	Class Control
Student (N)	35	35
Average score (g)	51,09	18,25
Score minimum	-.11	-.43
Score maximum	82	65

In accordance with the table of the results of testing the hypothesis above, it can be seen that the value of Gain (g) in the experimental class is greater than the control class ( $51.09 > 18.25$ ) which means there is an increase in learning outcomes in the experimental class, so  $h_0$  is rejected and  $h_1$  is acceptable.

#### Testing the Fourth Hypothesis

$H_0$  : There is no increase in student learning activeness in the application of the Problem Based Learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks

$H_1$  : There is an increase in student learning activeness in the application of the Problem Based Learning learning model combined with the Investigation Group and the conventional learning model of the X-Axioo class of SMK Negeri 5 Surakarta on computer subjects and basic networks.

Testing the fourth hypothesis is done to determine the increase in student learning activeness in the experimental class before and after the implementation of learning models Problem Based Learning in Group Investigation using the gain test. The results of the test are as follows:

*Table 4 Example of Format for Tables (Source)*

Variansi	Class Eksperimen	Class Control
Student (N)	35	35
Average Score (g)	31,63	4,05
Score minimum	-46	-.85
Score maximum	84	61

Based on the test results, the value of Gain (g) in the experimental class is greater than the control class ( $31,63 > 4,03$ ) so there is an increase in student learning activity which is quite good, so  $h_0$  is rejected and  $h_1$  is acceptable.

### 3.2. ANALYSIS

#### First Hypothesis

The first hypothesis concludes that there are differences in learning outcomes in the experimental class that apply the Problem Based Learning model combined with Group Investigation and the control class that applies the conventional learning model.

#### Second Hypothesis

The second hypothesis concludes that there are differences in the learning activeness of students in the experimental class who apply the Problem Based Learning model combined with Group Investigation and the control class that applies the conventional learning model.

#### Third Hypothesis

The third hypothesis concludes that there is an increase in learning outcomes in the experimental class that applies the Problem Based Learning learning model combined with Group Investigation and the control class that applies the conventional learning model.

#### Fourth Hypothesis

The fourth hypothesis concludes that there is an increase in learning activity of students in the experimental class who apply the Problem Based Learning learning model combined with Group Investigation and the control class that applies the conventional learning model.

#### 4. CONCLUSION

Based on the results of the research and discussion conducted, it was concluded that:

1. There are differences in learning outcomes in the experimental class that apply the Problem Based Learning learning model combined with Group Investigation and the control class that applies the conventional learning model.
2. There are differences in the learning activeness of students in the experimental class who apply the Problem Based Learning learning model combined with Group Investigation and the control class that applies the conventional learning model.
3. There is an increase in learning outcomes in the experimental class that applies the Problem Based Learning learning model combined with Group Investigation and the control class that applies the conventional learning model.
4. There is an increase in learning activity of students in the experimental class who apply the Problem Based Learning learning model combined with Group Investigation and the control class that implements conventional learning model.

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