

Effectiveness of Project-Based Learning Model Implementation with Peer Tutor Method in terms of Students' Active and Learning Outcomes in Graphic Design Subjects

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ABSTRACT

This study aims to find out how the influence caused by the use of learning models on the activeness and learning outcomes. The method used in this research is quantitative quasi experimental design. The population in this study were 66 students of class X RPL A and B in SMK Negeri 5 Surakarta. The sampling technique in this study uses the cluster random sampling method and the number of samples refers to the total population of class groups. Data collection techniques are used in the form of questionnaires and tests. Hypothesis testing is done by t test and normalized gain test. The results used in this study are based on the significance value (sig.) Which has the meaning as a determinant of whether the hypothesis test results are accepted or rejected . So that the results of this study can be used as information for educators to be considered in preparing the learning process better. In addition, it encourages students to play an active role in learning so as to achieve the desired learning goals.

Keywords: Learning Model, Project Based Learning, Peer Tutors.

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1. INTRODUCTION

In this age the development of the country is very important, this affects the quality of human resources. HR is something that is important in determining the progress of a country including Indonesia. Hasibuan (2003: 244) explains that HR is the ability to harmonize with one's physical and educational abilities.

The role of education is very important for the quality of human resources in meeting the needs that exist in the world of work. This is in line with the researchers' conclusions that read, "Education is one of the main ways to improve the quality of human resources." Ruhana, I. (2012). According to HDI (Human Development Index) data for 2018, Indonesia ranks 116th. The data indicates that the level of education in Indonesia has not gone well.

Education in Indonesia is divided into several levels of Education. Vocational Education or Vocational High School is one of them. According to Law No. 20 th 2003 The implementation of vocational education in Indonesia is "specifically aimed at preparing students to become productive people, able to work independently, filling existing job openings as middle-level workers in accordance with the competencies in the chosen expertise program, preparing students to be able choose a career, be tenacious, and be persistent in competence, adapt in the work environment and develop professional attitudes in the area of expertise that interests him, equipping students with science, technology and art to be able to develop themselves later on both independently and through more levels of education high, and equip students with competencies in accordance with the chosen expertise program ". One of the expertise programs in vocational education is Graphic Design.

"Graphic design is a form of visual communication that uses text or images to convey information or messages as effectively as possible Haka (Hadi, 2017)". Graphic Design is an expertise program that has very broad

employment prospects. Almost all companies use and require experts who master graphic design for many uses such as making pamphlets, posters, backdrops for product and company marketing needs. But in reality we still often encounter obstacles that occur in the field in the implementation of the learning process of the Graphic Design expertise program.

Based on the results of preliminary observations made in class X RPL SMK Negeri 5 Surakarta, especially in the Basic Graphic Design subjects it was found that most students have not mastered the material that the teacher has submitted. This is influenced by several factors including: 1. The learning model used by teachers is not going well, 2. Student activity is very low because they are bored with the material delivered by the teacher, 3. There are significant differences in skill abilities between students. Of all the causes of the problem, there are several solutions, and one that is suitable is to apply the right learning model. Therefore, the authors are interested in researching and discussing these problems into thesis research with the title "Effectiveness of the Implementation of Project Based Learning Models with Peer Tutor Methods in terms of Student Activity and Learning Outcomes in Graphic Design Subjects".

2. RESEARCH METHOD

This research is a quantitative quasi experimental design research. Research is carried out on human objects separated into groups. Experimental groups / classes were treated in learning by applying the PjBL learning model to the Peer Tutor method in Graphic Design subjects. While in the control group / class not given treatment but in the learning process applying conventional learning models. In this study, the population is class X students of RPL A and B of SMK Negeri 5 Surakarta, the sample taken as a whole from the total population is 66 students, while the sampling technique used is cluster random sampling. In this study data collection techniques using questionnaires and tests.

3. RESULT AND ANALYSIS

For the results to be accounted for, the data analysis in this study must meet the analysis prerequisite tests. The analysis prerequisite test in this study consisted of the Normality Test, Homogeneity Test and Balance Test. The test results show a sig value > 0.05. Then hypothesis testing can be done. Hypothesis testing is done by using the t test analysis (independent sample t test) and the normalized gain test to determine whether there are differences in the level of effectiveness between the two learning models.

3.1. RESULT

First Hypothesis Testing

Ho: There is no difference in the level of effectiveness of student activeness between the classes applying the Project based learning model with the Peer Tutor approach and the class applying the conventional learning model.

Ha: There is a difference in the level of effectiveness of students' activeness between classes applying the Project based learning model with the Peer Tutor approach and the class applying the conventional learning model.

Table 1 First Hypothesis T Test Results (Active)

Variable	Control Class	Experiment Class
Number of Students (N)	34	32
Significance Value Posttest	,002	

Table 2 Calculation of Hypothesis Gain 1

Variable	Control Class	Experiment Class
Number of Students (N)	34	32

Gain Score Mean (g)%	1,23	33,47
Minimum Score	-0,153	-0.200
Maximum Score	51	83

Based on the results of the previous balance test we can know that the initial conditions of student activity in both classes are balanced while for the results of the final condition test (posttest) the activity shows the number 0.001 (sig <0.05) which indicates that there are significant differences between the control class and the experimental class .

Furthermore, to find out how much the effectiveness of each class is active, a calculation using normalized gain with the calculation results can be seen in table 2.

In accordance with the results of the calculation table of the hypothesis 1 gain calculation shows that the value of the gain score (g) activeness in the experimental class is greater than the value of the activeness gain score of the control class ($33.47 > 1.23$), so that in the first hypothesis testing H_0 is rejected and H_a accepted.

Second Hypothesis Testing

H_0 : There is no difference in the effectiveness of learning outcomes between classes applying the Project based learning model with the Peer Tutor approach and the class applying the conventional learning model.

H_a : There are differences in the effectiveness of learning outcomes between classes applying the Project based learning model with the Peer Tutor approach and the class applying the conventional learning model.

Table 3 Second Hypothesis T Test Results (Learning Outcomes)

Variable	Control Class	Experiment Class
Number of Students (N)	34	32
Significance Value Posttest	,001	

Table 4 Calculation of Hypothesis Gain 2

Variable	Control Class	Experiment Class
Number of Students (N)	34	32
Gain Score Mean (g)%	12,25	42,54
Minimum Score	-0,142	-0,430
Maximum Score	86	93

Based on the results of the previous balance test we can know that the initial conditions of learning outcomes in both classes are balanced while for the results of the final condition test (posttest) shows the number 0.001 (sig <0.05) which indicates that there is a significant difference in the final condition between the control class with experimental class. Furthermore, to find out how much the effectiveness of the learning outcomes of each class, a calculation using normalized gain is performed with the calculation results that can be seen in table 4.

In accordance with the data table calculation results of the hypothesis 2 gain shows that the value of the gain score (g) of learning outcomes in the experimental class is greater than the value of the gain score of the control class learning outcomes ($42.54 > 12.25$), so that the first hypothesis testing H_0 rejected and H_a accepted.

3.2. ANALYSIS

A good teacher is one who can master the conditions and situations before teaching. When the teacher understands the conditions and situations in the classroom well, he will be able to determine in what way students will be given an understanding of the material. Determining the right learning model is a way to create good and effective learning situations. This effectiveness can later spur the creation of active and communicative learning situations so as to create a strong bond between teacher and student. With the right learning model, students will be more enthusiastic and enthusiastic to follow and understand the learning material. So that it gives a positive impact on student achievement and learning outcomes.

Types of learning models vary with their respective strengths and weaknesses. The selection of learning models must be adapted to the existing conditions. In accordance with the conditions in the two sample classes selected for research, students tend to be passive, bored and not interested in participating in teaching and learning activities. It was proven when the teacher was explaining the material with the lecture method the students just listened briefly then looked for other activities. So when the teacher finishes explaining and giving assignments to students, they have difficulty in completing it.

Research on the effectiveness of project based learning model learning with peer tutoring methods in terms of student learning outcomes and activeness in multimedia subjects in class X RPL aims to determine the effect of these learning models compared to conventional learning models. The study was conducted during 4 meetings in both classes. The first meeting was filled with pre-test activities in each class with multiple choice questions to measure learning outcomes and questionnaires to measure student activity with the same types of questions and questionnaires. This pretest is used as a benchmark for students' initial abilities before research is carried out, as well as being an advanced data for analysis prerequisite tests to obtain valid hypothesis test results. The results of the pretest of the control class got an average value of 70.58 and the experimental class of 70.19, indicating that the average pretest of the two classes had not yet reached the minimum completeness criteria (KKM) which was set at 75. Of the two classes no more than 11 people have achieved the KKM score. This proves that the mastery of student material about multimedia is still lacking due to the low activity of students during the learning process.

At the second and third meetings, each class was given the application of treatment according to the predetermined learning model that is given the application of conventional learning models in the control class and the project based learning model and the peer tutoring method in the experimental class. Students participate in learning for a total of 4 meetings with each predetermined learning model.

The fourth meeting of each class was given a final test (posttest) with the material questions were the basis of multimedia coupled with the material that had been taught and also given the final questionnaire. This posttest was conducted to measure the level of students' understanding of the material and to measure the level of student activity after the application of treatment. From the results of the second posttest the class experienced an average increase in the control class by 76.76 while the experimental class amounted to 84.06. Based on the increase in value, there was an increase in the number of students who reached the kkm value, namely the control class of 23 students and the experimental class of 27 students.

After obtaining research data about student learning outcomes and activeness then a normality test is performed. Based on the normality test, the results obtained from the data of the two sample classes are normally distributed and can be continued for homogeneity tests. Homogeneity test is carried out using the Levenes Test to find out whether the data has a relatively equal variance (homogeneous). In the homogeneity calculation using the spss application, the significance value for the pretest was $0.815 > 0.05$ and the posttest was $0.667 > 0.05$, while for the activeness of the students the initial activity was $0.530 > 0.05$ and for the final activity was $0.094 > 0.05$ which means that both classes have the same initial ability.

From the hypothesis testing data discussed, several conclusions can be drawn as follows:

1. There are differences in the effectiveness of student activity in the control class by applying conventional learning models with the experimental class by applying the project based learning model and peer tutoring methods.

This statement is proven by the results of Hypothesis 1 Test which shows the results of the independent sample t test that the significance of the final activity of 0.001 with the H1 hypothesis criteria is accepted if the significance value < 0.05 , means that it can be concluded that there are differences in student activity in the two

classes with each application of the learning model. This is reinforced by the results of Normalized Gain Calculation which shows that the value of the gain score (g) activeness in the experimental class is greater than the value of the activity gain gain control score ($30.99 > 1.23$),

With these data it can be concluded that the activeness of the experimental class is better than the control class. And the learning model in the experimental class that is project based learning model and peer tutors is more effective than the conventional learning model in the control class to increase student activity.

2. There are differences in the effectiveness of learning outcomes in the control class by applying conventional learning models with the experimental class by applying the project based learning model and peer tutoring methods.

This statement is proven by the results of Hypothesis 1 Test which shows the results of the independent sample t test (independent sample t test) that the significance of the posttest learning outcomes of 0.002 with H1 hypothesis criteria is accepted if the significance value < 0.05 , it means that it can be concluded that there are differences in learning outcomes in both classes with each application of the learning model. This is reinforced by the Normalized Gain Calculation results which indicate that the value of the gain score (g) of learning outcomes in the experimental class is greater than the value of the gain score of the control class learning outcomes ($42.54 > 12.25$),

With these data it can be concluded that the experimental class learning outcomes are better than the control class. And the learning model in the experimental class that is the project based learning model and peer tutors is more effective than the conventional learning model in the control class to improve student learning outcomes.

From the results of the analysis of the research data above it can be underlined that the differences and the more significant improvements occurred in the experimental class. The difference in the significance value to the improvement of student learning outcomes and activeness occurs due to differences in the treatment applied through the learning model used, namely conventional learning models in the control class and project based learning models and peer tutors in the experimental class.

Significant improvement in the experimental class occurred because the project based learning model and peer tutors trained students to actively collaborate and exchange ideas with their peers so that there was an intense communication process which then led to the transfer of knowledge between students. With this students will find it easier to discuss with each other find solutions to the difficulties experienced. Strengthened with peer tutors which train students not to hesitate to exchange ideas and take responsibility and have a leadership spirit. Students become accustomed to helping one another with difficulties and are reluctant to ask their teacher so they can complete their assignments on time. According to Djamarah (Ningrum, 2011) "There is an increase in learning outcomes for students who are reluctant to ask questions or are afraid of their teachers, so that with this tutorial it is expected that students can freely ask their own friends"

In terms of assignments, the experimental class students proved to be more orderly and disciplined to collect their assignments on time, because students worked together to be able to solve problems together. In contrast to the completion of control class assignments that tend to lack discipline and ask for time leeway in the collection of tasks. According to Francese, et al. (2015) states that "Students exploit PjBL to cooperate in solving real problems and accomplishing tasks typical for the world of work. It is easy to follow that PjBL requires high student involvement. This opinion means that students use PjBL to work together to solve real problems and solve various tasks for the workforce later. Cooperation requires students to interact with each other actively so that learning is carried out actively and not monotonous. In accordance with (Kemdikbud, 2014) that "Project based learning makes students become more active and successfully solve complex problems.". In line with research conducted by Roby Ika Kurniawan in 2018 that the learning outcomes and activeness of class XI students of SMK N 2 Wonosari by applying the project based learning model and using peer tutoring methods are better than conventional learning.

4. CONCLUSION

Based on the results of research and discussion conducted by researchers to determine differences in the increase in effectiveness of peer tutoring Pjbl learning models with conventional learning models obtained the following conclusions:

1. There is a difference in the effectiveness of student activeness between the class applying the Project based learning model with the Peer Tutor approach and the class applying the conventional learning model.
2. There is a difference in the effectiveness of learning outcomes between the classes applying the Project based learning model with the Peer Tutor approach and the class applying the conventional learning model.

3. The learning model in the experimental class (Project based learning with peer tutor approach), its application is more effective than the conventional learning model in the control class to improve student activity and learning outcomes.

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