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The Influence of Project-Based Blended Learning Toward Outcomes Student Learning

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***Abstract*—The research aims to determine if there are any differences in the use of the Project-Based Blended Learning (PjB2L) method that Edmodo assisted with the repository learning model on student learning outcomes in graphic design lessons. The method used in this study is quasi-experimental quantitative. The population in this study was 60 students, consisting of 30 students did use project-based learning methods mixed (experimental classes) and 30 students did not use a mixed project-based learning method (control class). The data collection techniques used are test study results, namely pretests and posttest which is a question of multiple choice. This pretest and posttest are given to the control class and experiment class. The results of the study in the calculation of posttest resulted in Sig. 0.000 which means the value is less than 0.05 so H0 rejected and H1 accepted. Thus, it can be concluded that the results of the research received there are any differences in the use of the Project-Based Blended Learning (PjB2L) method that Edmodo assisted with the repository learning model on student learning outcomes in graphic design lessons.**

Keywords: Blended Learning, Project-Based Learning, Project-Based Blended Learning

I. INTRODUCTION

TSMK is an educational institution that has been prepared to print competent graduates and have skills in certain fields to be able to directly enter the workforce [1]. SMK has several skill programs that can be chosen by the students according to their interests and talents, each SMK has a different skill program. In SMK Negeri 6 Surakarta there are 7 skills programs. One of them is Multimedia (MM).

Some of these expertise programs have productive lessons that differ from other skill programs, which are expected to improve and hone student's academic abilities. Basic graphic design is one of the lessons in the multimedia department, precisely in the X (ten)-class multimedia.

Based on the field observation, any problems occurred in the basic learning of graphic design in X (ten)-class multimedia. All the problems that happened impacted the student learning outcomes, this is evident from the 60.6% of students got the value under the assigned standard score which is 75. In response to this, a modern learning model is needed by utilizing information and communication technology that can increase students' understanding of the subject matter that will affect student learning outcomes.

Distance learning implements a learning system that does not take place in a classroom, so there is no face-to-face interaction between the teacher and the student. With the development of information and communication technology, the interaction between teachers and learners can be done, either in real-time or not [1]. Distance learning can be combined with face-to-face learning, commonly called blended learning. Blended learning is a combination of face-to-face learning with e-learning that can be used by anyone, anywhere, anytime. The term of blended learning contains the meaning of mixing or combining learning or blending of elements of direct face-to-face learning and online harmoniously and the ideal Mix [2].

The results showed that the learning of blended learning influenced the motivation and learning outcomes of students [3]. By using blended learning models, students can be more active, communicative and interactive in the following learning and developing their knowledge. One of the blended learning models that teachers can use is using a combination of blended learning models with project-based learning, commonly referred to as project-based blended learning. Moreover, basic graphic design is an applicative subject. According to Harper [4] using project-based learning can make students more active in learning and developing their skills in creating a product.

By following the above background, researchers are interested to prove that there is any influence in project-based blended learning towards grade X (ten) student learning-outcomes in Multimedia at SMK Negeri 6 Surakarta on basic graphic design lessons.

II. RESEARCH METHODOLOGY

A. Methodology

The type of research used is quantitative research, which can be interpreted as a research method based on the philosophy of positivism, used to research on certain populations or samples, data collection using instruments research, data analysis is quantitative/statistically, to test a predetermined hypothesis [6]. Quantitative research is a process of finding the knowledge that uses numeric data as a tool to find descriptions of what we want to know. Research can be performed through descriptive research, correlation

research, quasi-experimental research, and experimental studies. In this regard, researchers use experimental quasi-research aimed at disclosing causal relationships by involving control groups in addition to the experimental group. While the research design used is pretest-posttest control design, in this form two groups are each randomly selected which is an experimental group that is given treatment with a project-based blended learning method and control groups that are given treatment with ordinary project-based learning.

B. Sample

The sampling technique used by researchers to acquire data is a random sampling cluster (sampling area). A random sampling cluster technique is used if the population does not consist of individuals, but rather consists of groups – individual groups or clusters [6]. The samples in this study were taken from all populations because the population was not large, i.e. the class X Multimedia 1 amounted to 30 students (experimental classes) and X Multimedia 2, numbering 30 students (control class).

C. Data Analysis Technique

In this study, the data collection techniques used are test learning results, namely pretests and posttest which is a question of multiple choice. This pretest and Posttest is given to the control class and experiment class. The pretest was used to measure the initial ability before learning interactive multimedia design using a project-based blended learning model started and posttest to measure student learning outcomes after learning. Before pretests and posttests are used for research carried out in advance trials (tryout) to determine the validity and reliability. An instrument can be said to be valid when able to measure what is needed and can reveal data from properly researched variables. Determination of validity is taken on the basis when R calculates > R table, then the item is said to be valid, likewise vice versa. In addition to being valid, the instrument must also meet the reliability standards. An instrument is said to be reliable if it is trustworthy to collect research data. Reliability suggests a sense that an instrument can be trusted enough to be used as a data collector as the instrument is good enough [7]. The result is reliable when the value of Cronbach's Alpha > 0.60.

III. RESULT

A. Instrument Analysis

The instrument in this study tested through the try-out on 30 students. The number of items that used as much as 50 items (25 pretests and 25 posttests). Based on the number of learners in the activity tryout known value of the r table = 0.361. From the calculation of the try out results, the item passed the validity test as much as 39 items (19 pretests and 20 posttests).

Table 1 results of validation and reliability of instruments

Try Out		**Item**
Validation	Pretest	1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 13, 15, 17, 18, 20, 21, 22, 23, 24
	Posttest	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23
Reliability	Pretest	0.876
	Posttest	0.865
Conclusion		
	Passed :	
	Pretest	1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 13, 15, 17, 18, 20, 21, 22, 23, 24
	Posttest	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23
	Drop :	
	Pretest	7, 9, 14, 16, 19, 25
	Posttest	4, 16, 17, 24, 25

B. Data Description

Data descriptions include data processing of pretests results carried out before treatment and also obtained from posttest results carried out after treatment for students numbering 60 persons, with details 30 students of experimental classes and 30 students of the control class.

1) *Data Description of Pretest*. The initial ability value is obtained through a multiple-choice test of 19 questions.

Table 2. data description of pretest (experimental classes and control classes

Statistic	Experimental Class	Control Class
Mean	67.33	60.5
Minimum Value	37	42
Maximum Value	89	84
Std. Deviation	12.973	10.906
Variance	168.298	118.948

2) *Data Description of Posttest*. The initial ability value is obtained through a multiple-choice test of 20 questions.

Table 3. data description of posttest (experimental classes and control classes)

Statistic	Experimental Class	Control Class
Mean	78.5	68.33
Minimum Value	60	50
Maximum Value	95	80
Std. Deviation	10.434	7.466
Variance	108.879	55.747

C. Result of Prerequisite Test

1) Balance test. The balance test is done on experimental classes and control classes. The balance test of the study aims to determine whether the capabilities of the

experimental class and the control class are balanced. This test was conducted before the treatment of the study was given. In this test, using the Independent-Sample T Test with an error status of 0.05 that has a result 0.334. With the results of the balance test, it can be concluded that both classes are equal or balanced.

2) Normality Test. The normality test is to use the Kolmogorov-Smirnov test with the help of SPSS 21 application. When the value of > probability (SIG) is significant (0.05) then it means data distribution is normal and when the value of the probability (SIG) < level is significant (0.05) then the data is not a normal distribution. As in the pretests results on the experimental class 0.165 > 0.05 and pretests in the control class is 0.200 > 0.05. While the posttest results in the experimental class is 0.169 > 0.05 and the control class is 0.095 > 0.05. Thus, it is concluded that the results of the normality pretests and posttest classes on the experimental class and the control are a normal distribution.

3) Homogeneity Test. Test homogeneity is done to determine if both data are is derived from a population that has the same variant (homogeneous). In the test of homogeneity in this study is using Test Levene's with the help of SPSS 21, with an error status of 0.05. The calculation, the result is known that the large value of pretests sig. The control class and the experiment is 0.334 while the posttest sig value is 0.097. Both values have a value greater than the error 0.05. Thus, it can be concluded that the samples in this study came from a homogeneous population.

D. *Result of Hypotheses Test*

Hypothesis testing on this study uses the Independent Sample T Test on pretests and posttest results that have been given to experimental classes and control classes. The pretests results are used to determine if the initial ability that the learners have in both classes is balanced. While the results of posttests are used to determine if there are differences in learning outcomes of experimental class and control class.

Table 4. result of the hypothesis test

Variances	**Levene's Test**		**T Test**	
	F	Sig.	t	Sig. (2-tailed)
Assumed	2.849	0.097	4.340	0.000
Not Assumed			4.340	0.000

IV. DISCUSSION AND CONCLUSION

Based on the above research results, it can be concluded:

a) There are differences in learning outcomes by using Project-Based Blended Learning with Project-Based Learning. The difference between the learning outcomes is derived from the experiment class and the control class.

b) There are increased learning outcomes using Project-Based Blended Learning, judging by the average student grades before using Project-Based Blended Learning which is 67.33 and after using Project-Based Blended Learning to be 78.50. So, there was an increase of 11.17.

c) Project-Based Blended Learning allows students to learn independently

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