

How to Apply Hybrid Learning for Improving Students Understanding about Regression Model

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Abstract: Most Universitas Negeri Surabaya economics education students find it difficult to understand the regression model in econometric courses. The result of their tests on this material indicates an unfavorable value. Implementation of hybrid learning is expected to improve students' understanding of the regression model. A comparative test of student test scores is conducted on students in conventional learning class with students in hybrid learning class. This comparison is made in 2 (two) conventional learning classes conducted in 2016 and 2 (two) classes of hybrid learning conducted in 2017 with the same teachers and materials. Based on the test of analysis of variance (ANOVA), it is known that the test value of students in hybrid learning is better when compared with the value of students in conventional learning.

1 INTRODUCTION

1.1 Background

Econometrics course is one of the subjects taught in Economic Education Studies Program of Universitas Negeri Surabaya. This course is taught to equip students in order to have insight and skills of conducting a quantitative economic analysis. Econometrics is one powerful tool used to analyze microeconomic and macroeconomics problems (Greene, 2012). Econometric analysis is also possible to apply to the problems of education, especially economic education.

The Curriculum Development Team of the Economic Education Studies Program of the State University of Surabaya views the important economic courses for the students. After taking this course students are expected to be able to analyze the problems faced by the appropriate analytical tools, especially when using regression analysis model. However, most students consider this course a difficult course.

Student exam scores also show unsatisfactory results. Where in 2016 there are only 17 out of 80 Economics Education Program students whose econometrics test scores fall into the satisfactory category (above 75 points) while the other 63 are not

satisfactory. While the basic study of this subject is the material model of the regression equation. If students are able to understand well about the concept and characteristics of this regression model, the students will not have difficulties in the development material.

The existence of these problems needs to find the best alternative solutions. This solution should be possible to be applied both technically and in terms of cost. In general, there are four main things that determine learning that is (lecturers, students, challenges, and teaching method). According to Kaufeldt (2008), there are six elements in the learning process. These elements are the physical environment, the social environment, the presentation by the teacher, the content or the learning materials, the learning process, and the learning products. According to Hamalik (2004), students who are one component in teaching, is the most important component among other groups. Students are the decisive element in teaching and learning process.

All elements in the learning process must match the needs and characteristics of students. Like students in developing countries in general, the characteristics of students majoring in Economic Education tend to be passive and prefer something instant. Most students do not engage in interactive classroom learning, they tend to be quiet and reluctant

to develop what they have learned in classroom learning. They tend to accept what material is presented in the lecture.

Students have not used the maximally available learning resources. Students are still fixated on conventional learning resources, such as reference books that are not diverse. Situations such as these make learning into teacher oriented (teacher oriented) has put students as objects that are less profitable. Lecturers eventually play the most dominant source of learning.

Application of hybrid learning makes the opportunity to reduce teacher-oriented learning. Hybrid Learning, often also called Blended Learning, is a method of learning that combines conventional learning methods with online learning. Learning methods can be face to face every day, then there are some components of e-learning learning that is inserted, or vice versa, most e-learning learning, and then inserted face-to-face method for review or assessment. Twigg (2003), which classified the types of hybrid learning into four types of learning models: replacement, supplemental, Emporium, and buffet.

The model proposed in this study is a replacement model, some parts of the face-to-face lecture are replaced with learning materials in the form of self-learning applications. This application was developed with Android platform given to the students. Thus the meeting time in the classroom will be reduced.

Application of hybrid learning is expected to increase student learning activities where students are more active in deepening the concept and application of regression models independently. Students are aware of the source of information and other learning resources so that the students are rich in their point of view, thought, analysis and application. Media self-study also this opens opportunities for learning activities that are fun for students because it can be done anytime and anywhere.

Some studies of learning using this approach include the study of Scott III (2011) which offers economic learning using tablet computers has increased student engagement and make learning more dynamic. Chen & Chen's (2011) study on the use of learning media with hyperlinks significantly improves student learning performance and deepens student knowledge when discussing.

For mathematics-based learning Gönül and Solano (2013) studies that examine the use of computer media in a combination of learning environments show a very positive effect on student learning outcomes on difficult learning materials i.e. business mathematics. Lee et al (2017) conducted research on the application of blended learning in algebra classes

at Korean universities resulted in a significant increase in maturity of mathematical views, reflection quality, and student satisfaction. While Metzgar (2014) whose study compared traditional learning with hybrid learning that states that in hybrid learning students feel more happy and motivated to learn than traditional learning.

A hybrid approach is not a learning without a weakness. Hybrid learning may fit a particular class size not for all. It may also not be effective when applied to diverse students in diverse disciplines (Westover & Westover, 2014). Jackson & Helms (2008) suggests that the implementation of blended classes still exhibits the same weakness as the online format, the addition of face-to-face interaction does not minimize weaknesses. According to this study both teachers and students found no significant differences between conventional e-learning learning with hybrid learning.

1.2 Statement of the Problem

The low understanding of the students of economic education on the concept of regression equation model needs to find the right solution. This solution should match the needs and characteristics of the students as well as be applicable. The application of hybrid model replacement learning is expected to improve students' understanding of the concept of regression model. Thus the hypothesis in this research is to apply hybrid learning model replacement understanding of student about regression model better than with conventional learning.

1.3 Research Objective

The purpose of this study is to find out whether by applying hybrid learning complementary model can improve student understanding of the concept of the regression model. In addition, the study also as an effort to reproduce the study of the application of hybrid learning on learning in the modern era.

1.4 Research Question

The research question is whether the application of hybrid learning can improve students' understanding of the concept of the regression model.

2 METHODS

The approach used to answer the research feast is a quantitative approach. The tool used to test the re-search hypothesis is Analysis of variance (ANOVA). ANOVA analysis is one multivariate analysis technique that can differentiate the mean of two or more data groups by comparing its variance (Ghozali, 2009). This analysis is used to know the difference of students understanding the regression model. To prove whether the understanding of students who follow hybrid learning class learning with the under-standing of students who follow the conventional learning process conducted a comparison of test results in two conventional classes and two classes of hybrid. Two conventional classes are implemented in 2016 and two hybrid classes by 2017 with the same materials and teachers. Students of Economic Education Studies Program of Universitas Negeri Surabaya basically tend to a passive character in the pro-cess in learning class, but generally, there is no significant character difference in each class. Each class consists of 41 to 43 students. Data were collected for each class in the final test after two meetings on the subject of the regression equation model implemented a week after the second meeting.

3 RESULTS AND DISCUSSION

Analysis of the application of complementary model hybrid learning was conducted on four classes consisting of two conventional classes and two hybrid classes. The total number of students analyzed is 167 students, of which 82 students are incorporated in conventional learning and 85 students follow hybrid learning. All of these students are joined in four classes, 42 students in class A and 40 class B students on conventional learning in 2016. While the hybrid class that was held in 2017 consisted of 42 students of class A and 43 class B.

The value of the test results in each class is presented in Table 1. In the class a conventional average value of the test results is 47.25 with a standard deviation of 18.81 while in class B obtained the average test value of 62.44 with standard deviation 14.57. In the hybrid class obtained the average test value of 75.69 with a standard deviation of 9.68 for class a while in grade B obtained the average test value of 71.12 with a standard deviation of 13.61. For the overall average grade of the conventional class is 54.66 with the standard deviation of 18.43, while for

the hybrid class the average test value is 73.38 with the standard deviation of 11.99.

Table 1: Results of the student regression model comprehension test.

Model	Class	Mean	Std. Deviation	N
Konven	A	47,2500	18,81238	42
	B	62,4375	14,56998	40
	Total	54,6585	18,43070	82
Hybrid	A	75,6905	9,67644	42
	B	71,1163	13,61234	43
	Total	73,3765	11,98509	85

Seeing the results of the understanding of the regression model of the students in the four classes can be compared simply, where the average value of hybrid learning tends to be better than conventional learning. This means that the application of hybrid learning can encourage students' understanding of the regression model. Seen from the smaller standard deviation value of hybrid learning when compared with conventional standard deviation grade values. This indicates that the hybrid class of students' understanding can be more evenly distributed. However, this needs to be proved statistically by using analysis of variance. This analysis is used to verify whether the variance of each group is significantly different.

The results of ANOVA test in the conventional class and hybrid class can be seen in Table 2. In the table shows that there is the direct influence of learning model to the students understanding of the regression model. This conclusion is based on F value of 61.68 with a probability value of 0.000 or less than alpha 0.05. Additional outputs that can be seen in this analysis are class A and B differences also determine student test results where the F value of 4.67 with a probability value of significance of 0.032 or less than the alpha of 0.05.

Table 2: Tests of between-subjects effects.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	15719,857 ^a	2	7859,929	33,495	,000
Intercept	684504,008	1	684504,008	2917,030	,000
Model Class	14473,673	1	14473,673	61,680	,000
Error	1097,003	1	1097,003	4,675	,032
Total	38483,889	164	234,658		
Corrected Total	742209,500	167			
Corrected Total	54203,746	166			

ANOVA test results proved that the application of complementary model hybrid learning can improve students' understanding of the concept of the regression model. This result is in line with Tsami research conclusions (2011) as well as research by Gönül and Solano (2013). By applying hybrid learning students can decide for themselves when and where he/she studies. Students can determine the right time in accordance with the style and habits in learning so that students can maximize the absorption of the material being studied. In addition, the process of learning with complementary media also allows students to learn repeatedly so as to retain their understanding.

Besides contributing to the improvement of students' understanding, hybrid learning is also able to encourage each student to be more active in learning. This is possible because students can easily begin the lesson without having to have an accompanying teacher. This happens because students can freely determine their own learning activities. Students are also more able to learn in situations with high privacy because learning materials are easy to carry any-where.

To see the student's response whether the applied hybrid learning triggered the students' enthusiasm for learning as well as the research conducted by Metzgar (2014), interviews were conducted on several students. Most of the students interviewed said they were encouraged to learn and feel more enthusiastic about understanding the subject matter.

4 CONCLUSIONS

Based on the test of analysis of variance (ANOVA), it is known that the test value of students who follow hybrid learning is better when compared with the value of students who follow conventional learning. The application of hybrid learning also encourages students to become more enthusiastic about learning. In the hybrid class students' understanding of the concept of regression also looks more evenly.

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