

Blended Learning Effectiveness in Improving Learning Access in Higher Education

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Abstract—One of the main problems of the development of higher education in Indonesia is how to increase public participation that is usually reflected by the Rough Participation Index (RPI). One of the government's programs to increase access to higher education is to utilize distance learning (DL) as one of the models of instruction. The legal protection to implement the DL has been available namely Law No. 12 the Year 2012 on Higher Education and, Regulation of Ministry of Education and Culture No. 109 the Year 2013 on the Implementation of Distance Learning in Higher Education. In addition to the Open University, there have not been a lot of Indonesian universities who develop and use DL as a learning model. This article conveying an experience of developing a not only valid but also an effective blended learning model of instruction in Universitas Negeri Padang, to expand access to higher education and finding alternative learning models to overcome the limitations that are owned by an institution of higher education.

Keywords—*blended learning; effectiveness; learning access; higher education*

I. INTRODUCTION

One of the main problems faced by universities in Indonesia today is the low level of rough participation index (RPI) of higher education. In the Year 2018, Indonesian Higher Education RPI has only reached 31.07%. This figure is low among ASEAN countries [1].

Some of the efforts made to increase the RPI of higher education over the past fifteen years are opening new study programs, establishing new universities, and providing scholarships which in terms of quantity are increasing. But this has not provided a rapid boost to increasing RPI for higher education. So that the problem of the low level of higher education RPI is inexhaustible, and is still listed in the 2015-2019 Ministry of Research and Technology's strategic plan.

Law No. 12 of 2012 concerning Higher Education, the seventh part regulates distance education (DL). Article 31 paragraph two states: Distance education as referred to in paragraph 1 aims to: (a) provide higher education services to groups of people who cannot attend education face-to-face or regularly; and (b) expanding access and facilitating higher education services in education and learning [2].

The law on higher education is expected to provide opportunities, through DL, to increase higher education RPI faster. Moreover, the following was followed by the issuance of Minister of Education and Culture Regulation No. 24 of 2012, then updated with the Minister of Education and Culture Regulation No. 109 of 2013 concerning the implementation of DL in universities [3]. On June 3, 2016 the Minister of Research and Technology of Higher Education invited universities to submit proposals for conducting studies with DL.

The existence of legal certainty as stated earlier, it is estimated that DL, with its various variants, will be one of the most important learning models in the effort to increase higher education RPI faster.

In addition to the Open University (OU), not many other universities have utilized DL in implementing their learning. Even if they exist, they are only complementary. Likewise, Universitas Negeri Padang (UNP), although the learning management system (LMS) is already available, only sixteen percent (16%) of lecturers use this facility for the learning process.

If we pay close attention to the implementation of e-learning carried out by 16% of the lecturers, it turns out that the lecturers have not utilized the facilities available at the LMS to the maximum. Generally lecturers use it to upload teaching materials, syllabi, and assignments to students. Very few lecturers really use the facilities available at LMS to develop learning systems that have been tested for their validity, effectiveness, and practicality.

This paper is based on some fundamental research reports for the second or final year in the development of blended learning models. This second year aims to find out how the effectiveness of the model is developed, and whether the model is useful for students with different learning styles.

Many definitions are used to describe the concept of blended learning. The most common definition is a combination of face-to-face learning in class with online learning, such as web-based learning modules, interactive demonstrations with electronic equipment, and through certain LMS [4], such as Moodle.

Besides that blended learning can also refer to a mixture of various learning event activities, including: face to face classroom, live e-learning, and self-paced learning. Blended programs can also be a mixture of: (a) offline and online learning; (b) self-paced and live collaborative learning; (c) structure and unstructured learning; (d) custom content with of-the-self content; and (e) learning, practice, and performance support. Also mentioned are the benefits of doing blended learning: (a) extending the reach; (b) optimizing development cost and time, and (c) evidence that blending works [5].

In addition, the definition that is often used is a combination of goodness in face-to-face learning with the goodness of online learning or e-learning [6].

In addition, learning activities that utilize ICT can be grouped according to the percentage of the proportion of ICT used. Blended learning is learning that combines the use of information technology online with face-to-face learning in which the proportion of ICTs ranges from 30-79%. The grouping is shown in Table 1 [7].

TABLE I. LEARNING TYPES BASED ON THE PROPORTION OF ICT

	Description	Type
0%	Full face to face	Traditional face to face
1% - 29%	Start using ICT next to face to face	Learning enriched with ICT
30% - 79%	Combine online learning with face to face	Blended learning
>80%	Most learning activities are carried out online	Fully online

With regard to student learning styles, many definitions of learning styles are found in various literatures. Dunn and Griggs [8] define learning styles as the way students concentrate, process, internalize, and remember new and difficult academic information. Furthermore, they theorize that learning styles consist of two biological and developmental characteristics that make certain environments, methods and learning resources effective for some students, and are not effective for others. Most people have certain learning style preferences and differ significantly.

A simpler definition is what Pritchard said, which defines learning style as the preferred way of learning; for example, preferring pictures to text; study in groups rather than self-study; or learning in a structured rather than unstructured [9]. So the concept of learning style refers to individual differences in terms of what learning models are most effective for them. Student learning styles need to be considered to accommodate the different needs of students in learning [10].

Learning styles are grouped in various ways. Pritchard [9] for example, classifying learning styles into four types, namely: Activists, Reflectors, Theorists, and Pragmatists; Neuron-Linguistic Programming (NLP) classifies learning styles into three, namely: (a) Visual, (b) Auditory, and (c) Kinesthetic [9]. Several other experts also proposed several classifications of other learning styles, for example Kolb in Montgomery

proposed that students could be classified into: convergent, divergent, assimilator, and accommodators [11].

One of the key factors that influence the participation of online learning is learning style [12]. Picciano developed a blended learning model with a multimodal concept. He suggested a good model for web-based learning, namely a model that synchronizes learning designed by lecturers with diverse student needs [13].

II. METHOD

A. Type of Research

This is development research (R &) using Borg & Gall's procedures which include: (1) research and information gathering, (2) planning, (3) development of initial product forms, (4) initial field tests, (5) initial revisions, (6) main field test, (7) operational product revision, (8) operational field test, (9) final product revision, and (10) dissemination and implementation [14].

Steps 1-7 were completed in 2016 which resulted in: (a) learning models, (b) learning tools consisting of syllabi, learning designs, learning materials, and instruments to measure student learning styles.

This study is the eighth and ninth step which produces the final blended learning model and information about the effectiveness of the model.

B. Research Subject

The study was conducted on two classes of Economic Education Department students who took the Research Method course. One class is used to test the blended learning model with 25 students, and another class as a comparison class, with 25 students' face-to-face learning classes.

C. Implementation of Blended Learning

This blended learning model was tried in the Research Method subject with 3 credits. How to combine face-to-face meetings online are 1 credit face to face in class and 2 credits online. The comparison is 33% face to face 67% online.

So a permanent face-to-face meeting is still done according to the class schedule, but the duration is only 50 minutes. While online learning depends on students according to their needs.

D. Research Design

The design of this study is a 2 x 2 factorial design, with variables: learning models, learning styles, and test scores. The research design is described as in Table 2.

TABLE II. FACTORIAL DESIGN 2 X 2

Model	Blended		Face to face	
Learning Styles	Audio	Visual	Audio	Visual
Test Scores	Average	Average	Average	Average

E. Data Analysis Technique

To test the mean differences between groups, analysis of variance (ANAVA) was used with the F test.

III. RESULTS AND DISCUSSION

There are main research results presented on this occasion, namely how the blended learning looks at the UNP e-learning portal, and how effective it is.

A. Display on E-Learning Portal

The blended learning format developed in the Research Methods course found on the UNP portal is shown as in figure 1.

Each subject consists of seven activities, namely: reading and understanding the learning objectives, reading a summary of the subject matter, summarizing the source book and uploading it individually, doing the exercises and understanding the good feedback, taking part in the study, holding discussions, and attending face-to-face meetings.

All activities are equipped with navigation that allows students to easily move from one activity to another that they want. In addition, students are also equipped with source books and learning designs that can be downloaded easily.

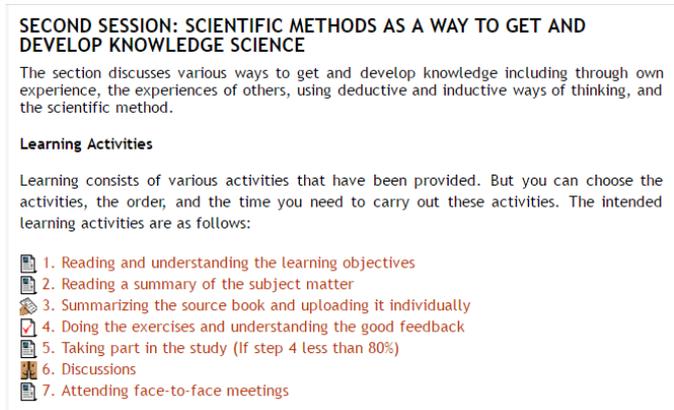


Fig. 1. Display of activities in e-learning portal.

B. Model Effectiveness

The effectiveness of the model can be seen from the results of the analysis summarized in Tables 3 and 4.

TABLE III. DESCRIPTIVE STATISTIC DEPENDENT VARIABLE: TEST SCORES

Instructional Model	Learning Styles	Average	Deviation standard	N
Blended Learning	Audio	39.73	3.101	11
	Visual	41.86	4.504	14
	Total	40.92	4.020	25
Face to face	Audio	43.20	1.317	10
	Visual	40.27	3.127	15
	Total	41.44	2.917	25
Total	Audio	41.38	2.958	21
	Visual	41.03	3.868	29
	Total	41.18	3.486	50

TABLE IV. CONCLUSION OF VARIANT ANALYSIS DEPENDENT VARIABLE: TEST SCORES

Source	Sum of Squares	dk	Average Square	F	Sig
Corrected model	82.951 ^a	3	27.650	2.482	.073
Intercept	82800.916	1	82800.916	4689.185	.000
Model	10.768	1	10.768	2.402	.331
Styles Model*	1.962	1	1.962	.950	.677
Styles Galat	77.920	1	77.920	.530	.011
Total	512.429	46	11.140		
Total	85385.000	50			
Corrected Total	595.380	49			

^a R squares = .082 (corrected R squares = .006)

From Table 3, some information is obtained, including: effectiveness of blended learning around 82% and face to face 83%. There is a tendency for blended learning to provide opportunities for individual students to develop more, which is marked by a greater standard deviation than face-to-face learning in class. Furthermore, the difference test of the two groups is summarized in Table 4.

The information that can be obtained from Table 4 includes: there is no difference in effectiveness between learning blended learning models rather than face-to-face learning in class.

C. Some Obstacles

There are several obstacles faced in the implementation of web-based learning models. Among them is changing the habits of students in the learning process. After years of being accustomed to face-to-face learning in class, students must change their habits by independent learning and communicate through the network.

In addition, ICT literacy that is still lacking is also a separate obstacle, not only from the students but also from the small part of the lecturers.

IV. CONCLUSION

The results of the study can be summarized as follows: (1) Blended learning can be used as an effective learning model in universities; (2) The use of blended learning will be able to increase higher education RPI between 31-79%; (3) Blended learning models can be used for students both with audio and visual learning styles.

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