Development of the Blended Learning Model On Web-Based Learning Course

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Abstract-*The blended learning model of learning courses Web-Based Learning to improve activities, learning outcomes and formulate the process of developing a blended learning model of learning PBW courses that are valid, practical and effective. This study uses the AIDM model which includes the analysis stage of the Analysis Stage, Evaluation Planning Stage, Concurrent Design Stage, Implementation Stage. The results obtained from the 4 aspects of the validity test are aspects of the model is very valid, the material is valid, the media is very valid and the language is valid. Furthermore, the practicality test of lecturer responses and student responses. While the effectiveness test is seen from the results of learning and student learning activities. Based on the above data it can be concluded that the blended learning model of PBW courses is valid, practical, and effective for use in the lecture process.*

Keywords: Blended Learning, Web-Based Learning, AIDM

I. INTRODUCTION

Field of Education Technology studies requires the provision of a variety of learning resources in the learning process. Learning that always innovates in every implementation will achieve learning goals well. Based on these explanations, the object of the Education Technology study requires a change in the learning process that is strongly influenced by the rapid development of communication technology. Developing learning by following the development of communication technology is expected to affect the success of the learning process and learning outcomes.

Smaldino, (2014) states that 21st-century learning also shows a strong desire to learn from sharing formats outside the book, using many resources collected through information and communication technology such as video, audio, and online. and sharing the media with others through non-structured facilities such as websites or online journals. Information and communication technology has become an inseparable part of people's private lives through the linkage using internet technology using computer devices and cell phones.

Based on observations on February 4, 2019, in the Postgraduate Education Technology Study Program of Padang State University of the students who take the Web-Based Learning course. The learning process that is taking place at this time is not optimally implemented. In fact in the learning process, students do not understand well the lecture material about the concept of learning websites in detail so that it makes students difficult in making learning websites which is the final project that must be completed by students.

Web-Based Learning courses require more discussion between students and lecturers to understand how to plan, create, implement and evaluate in Web-Based Learning. The results of the observation questionnaire that have been done, show an average of 2.59 and the value of the results of study subjects is not optimal, which means students still do not master and understand the Web-Based Learning lectures maximally.

Based on interviews with lecturers of Web-Based Learning on February 4, 2019, in the Education Technology Study Program S2 PPs UNP, said that the actual time required is not sufficient/limited if you have to explore all the material specified in the syllabus for one meeting. Also, students who are unable to attend will certainly miss a lot of lecture material for one meeting, consequently, not all topics are mastered by students. Therefore, the lecture time for Web-Based Learning for one meeting is not enough with only 2 SKS.

One solution that can be used in overcoming problems in Web-Based Learning courses is to develop a blended learning model by sharing 50% face-to-face and 50% online (25% synchronous and 25% non-synchronous). Discussion of lecture material is a continuation of face-to-face lectures and lecture material that is indeed prepared for blended learning. It is hoped that with the blended learning model there will be an increase in the quality of learning in the Web-Based Learning Technology S2 PPS UNP course.

This blended learning has its own space and specifically for students of Educational Technology Study Program when learning Web-Based Learning materials in addition to face-to-face lectures in class. This learning will not be focused on the implementation of conventional learning which is focused on face-to-face learning requirements. The development of blended learning provides an alternative that learning can remain carried out without having to meet directly with the supervisor.

Rusman (2012) explains that in "the development of online learning there are three developments, one of which is a web-centric course that uses the internet to combine distance learning and face-to-face, some material is delivered via the internet, and some is delivered through face-to-face with complementary functions". In this model, the lecturer can give instructions to students to learn lecture material through the website that has been made.

Based on the explanation of the problem above, another research by the researcher, Riwurohi (2016), has been conducted, this research examines the development of online and offline learning in the form of blended learning developed based on the study of learning technology based on Dwiyogo's blended learning design. In general, it is carried out in three stages, namely analysis, design and evaluation.

Furthermore, Nguyen (2015), makes the internet as a thing that allows it to be used in the implementation of online learning. In the end, many researchers and educators are interested in learning online to improve learning and improve student learning outcomes, especially in higher education. Nguyen examines the evidence of the effectiveness of online learning by organizing and summarizing findings and challenges of online learning into positive, negative, mixed, and incorrect findings. Special attention is paid to the analysis of the effectiveness of online learning. Overall, there is strong evidence to suggest online learning is as effective as traditional formats.

Furthermore, Prawiradilaga (2013) explained, "online class learning is an online class that uses virtual classroom learning strategies. Online or distance learning that carries out learning activities is not bound by time, place and the rhythm of the teacher's presence and can use electronic and telecommunications media tools. " Rickard (2010: 2) explains online learning, that online learning is learning that depends on communication technology (such as Internet-based services or intranets) and computer technology devices (such as computer hardware, cellular devices, and application software) for delivery all or most learning experiences. It can be concluded that online learning is the process of obtaining or receiving a learning experience that is fully or that combines online involvement with several face-to-face activities.

According to Alammary et al. (2014), blended learning is "combining or mixing web-based technology modes with direct virtual classes, which contain instructions, collaborative learning, streaming video, audio, and text to complete an educational goal". Besides blended learning is a combination of various forms of instructional technology (video recording, CD-ROM, website-based training, film) with face-to-face training with instructors.

Besides the notion of blended learning according to Jeffrey (2014) explains that blended learning is described as a teaching model that eliminates time, place, and obstacles while allowing high-quality interaction between teachers and students. Blended learning is a learning method that combines two or more methods and approaches in learning to achieve the objectives of the learning process.

In this research, the online learning model that will be developed is based on blended learning. Online learning is procedural in its implementation. Each implementation contains steps to follow and run the learning process by students. This learning model contains the implementation of learning process activities carried out through a website developed to improve the quality of learning.

II. METHODE

The development model in this study follows the AIDM (Alternative Instructional Design Model) development model which includes stages (1) Analysis Stage, (2) Evaluation Planning Stage, (3) Concurrent Design Stage, (4) Implementation Stage, (Davidson-Shivers, 1999).

Product testing will be developed based on development criteria that will create updates on products developed to improve the effectiveness, efficiency, and practicality of the developed website. Three criteria will be tested to assess the quality of the developed product, namely:

1. Product Validation

Product validation can be done by presenting several experts or experienced experts to evaluate the newly designed product. In this aspect, the validity test is intended to test the extent to which the developed blended learning model is valid for use, by the curriculum, and product components are consistently related to each other. Validity analysis is performed on data model validity, material validity, media validity, and language

validity. Validity data were obtained using a Likert scale of validators for all aspects assessed, presented in tabular form. Validity criteria based on final values are then presented on a scale from 0-100.

2. Prakticality

The practicality of a media refers to the extent to which users and practitioners state that the media developed can be applied and can be used in normal conditions. At this stage, a trial was carried out on students of the Postgraduate Education Technology Study Program at Padang State University.

The practicality category of the blended learning model Web-Based Learning Course based on the final grades obtained was obtained from the analysis of student response questionnaires and lecturer responses about the model used in the form of a Likert scale. The model usage sheet contains a description of the use of the learning model in terms of several aspects of assessment.

3. Effectiveness

The effectiveness of the product can be seen in student learning activities and learning outcomes. After the online learning model is produced and tried out in the learning activities it is necessary to evaluate the learning outcomes to see the achievement of the website-based online learning model towards the objectives of the Web-Based Learning course. The effectiveness developed was seen based on the results of the analysis of the student learning activity questionnaire and student learning outcomes. To obtain effective results using learning outcome data, data descriptions are generally used statistical techniques Paired T-Test.

III. RESULTS

1. Analysis

    a. Problem Analysis

The first objective of the analysis phase is to look at performance and identify appropriate solutions. In fact in the learning process, students do not understand well the lecture material about the concept of learning websites in detail so that it makes students difficult in making learning websites which is the final project that must be completed by students.

    b. Learning Component Analysis

    1) Analysis of Learning Objectives

Based on the pretest, the students' initial ability in learning achievement about mastering learning website design techniques using WordPress / Blogspot and designing them using WordPress for learning needs and can apply them in the learning process. Because the eleventh learning achievement is a special learning achievement that must be possessed by students in the Web-Based Learning course.

    2) Context Analysis

Web-Based Learning is a compulsory subject for students of PPs UNP Education Technology Study Program, the learning environment infrastructure at the UNP Postgraduate Building has been very well proven by the presence of LCD projectors for each class and internet network support via wifi.

Responsive Web Design (RWD) is a setup where the server always sends the same HTML code to all devices and CSS is used to change the rendering of the page on the device. Google's algorithm should be able to detect this setup automatically if all Googlebot user agents are allowed to crawl the page and its assets (CSS, JavaScript, and images).

    3) Student Analysis

Analysis of students is done through student ability observation sheets before using blended learning models in Web-Based Learning courses. Pretest contains 22 questions that are filled out by students about the subject matter to be studied.

Based on interviews with students, they have difficulty in finding references for making websites on the internet due to the variety of forms and concepts for making websites and from all students do not understand if creating websites using coding or programming languages. So they are more they need teaching materials about making learning websites free, practical, easy (without programming language) and fast.

    4) Content / Curriculum Analysis

The material taken is based on the RPS of Web-Based Learning courses, starting from the Nine meeting to the fifteenth meeting. The content of the material is adjusted to the textbooks that are owned by lecturers, other textbooks that support the subject matter in the RPS, and various internet sources related to the material so that it is rich in science. The material and submissions that will be developed support to be presented using text, images, and video elements. The results of the analysis of the material that will be presented on the development of the

blended learning model in the Web-Based Learning course in the Education Technology Study Program S2 PPs UNP.

2. Planning Evaluation Phase

Research on the development of the blended learning model of the Web-Based Learning course was conducted at the Postgraduate Educational Technology Study Program at Padang State University in the January-June 2019 semester. The evaluation planning stage is the stage of collecting data about stakeholders, the type of evaluation needed, the determination of the validator or reviewer, evaluation methods used and determination of evaluation time.

a. Stakeholders

Stakeholders can be interpreted as all parties related to the issues and problems that are being raised. This research was carried out in the Postgraduate Education Technology Study Program (S2) in Padang State University in the January-June 2019 semester.

b. Evaluated Products

This study aims to formulate the process of developing blended learning for Web-Based Learning Technology Education Study Program Masters Program Postgraduate in Padang State University, which is valid, practical and effective. The research products are in the form of model syntax, LMS website, materials and teaching materials used in Web-Based Learning courses.

c. Research Instrument Validation

The instrument validity, practicality, and effectiveness before it is applied first are assessed by the instrument validator. The instruments assessed are a) Instrument validity models, b) Material validity instruments, c) Media validity instruments, Language validity instruments, d) lecturer practicality instruments, e) Student practicality instruments, f) observation instruments for student learning activities, g) instruments pretest and posttest observation sheets.

d. Validator

The product validator in this study is determined based on the area of expertise and aspects of the product to be assessed. The validator's suggestions are used to revise the product being developed. At this stage, responses and suggestions from the validator about the product that has been made are written on the validation sheet as a correction material and states that whether this product has been valid or not.

3. Concurrent Design Stage
   a. Concurrent Design Stage I
   1) Design

This blended learning model cannot stand alone without any other learning component, so a blended learning website is also developed based on a learning management system and teaching material for demonstration video making of learning websites.

Synchronous blended learning (Type VI) is conducted in the presence of instructors and with electronic communication (Blended / Hybrid-synchronous). In this format electronic communication is packaged in asynchronous and synchronous formats, the presence of educators can be alternated between physical and virtual. Some class meetings are conducted by the physical presence (in traditional classrooms, ie face to face) and other meetings are held in a virtual manner (synchronous). From the explanation of the learning model, the syntax (steps) for developing the blended learning model of learning using personal models is as follows:
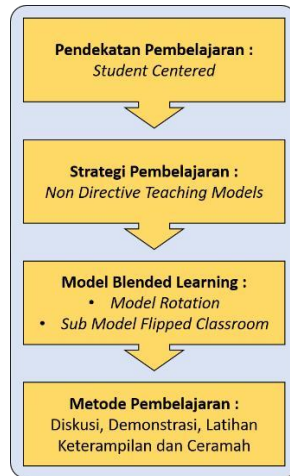
Figur 1. Blended Learning Model PBW Subject

Website Learning Management System (LMS) is used to support online learning in the implementation of the blended learning model. With the LMS website based on blended learning, the learning process will be carried out properly and not waste time.

The demonstration video making the learning website is based on the analysis of the needs of students who have done, the demonstration video serves as teaching material in PBW courses. The process of making a demonstration video is divided into two stages, the first stage of the image and audio recording process and the second stage of the video editing process.

2) Development

The learning model consists of a systematic and clear sequence of implementation steps. The syntax in the blended learning model of Web-Based Learning courses is used as a guideline in the implementation of Web-Based Learning lectures. The following is the syntax of the blended learning model of the Web-Based Learning course based on the learning model used, namely non-directive teaching models. The syntax in the blended learning model of Web-Based Learning courses consists of four namely face to face for theoretical material, online on the website for theoretical material, face to face for practical material and online on the website for practical material. Figure learning syntax diagrams can be seen in Figure 2-5.
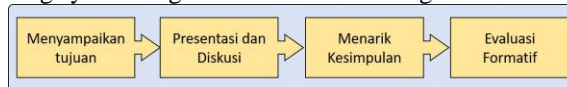

Figure 2. Syntax Face to Face in Class (theoretical material)

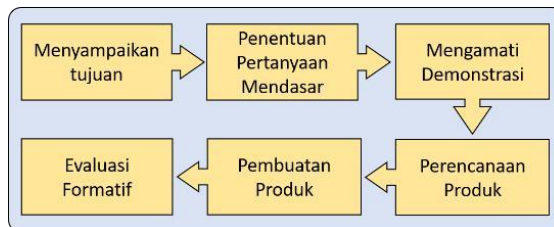Figure 3. Online Syntax on soniawan.com Website (theoretical material)

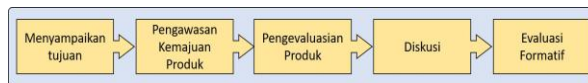Figure 4. Syntax of Face to Face Clear (practice/assignment)

Figure 5. Online syntax on the soniawan.com website (practice/assignment)

The website development of this blended learning model is based on Wordpress Learning Management System (LMS). This website has a Soniawan.com domain with product specifications a) the main page, there is the latest course information on the website, information to get usage guides, information to get e-books, website excellence, and website creator information. Navigation menus in the website header column are home, dashboard, courses, e-books, about and search fields. b) The course/class page contains courses that have been available and can be accessed by users. c) Module/e-book pages contain collections of e-books as teaching materials that can be downloaded by students. d) About page, contains an explanation of the website learning management system, usage guidelines for lecturers and students, as well as feedback on student experience while using the website in the learning process. e) The dashboard page functions as a registration page for new users, and functions as the main page of users who have registered to contain course information, grades, notifications, editing accounts after leaving the account. On this dashboard page, all user information can be seen. f) The course page is a mandatory page that is accessed first by students before entering into learning, on this page contains information about the synopsis of the course, course code, course family, weight / credits, implementation semester, lecturer supporting the course, column download syllabus / course RPS, and navigate each course meeting along with learning topics. To enter the learning page students must first log in to use the LMS website.

Teaching Materials in the form of demonstration videos are made based on students' analysis of the learning website creation. Video demonstration will present a complete and systematic steps for making a learning website divided into four videos, namely, a) introduction to learning website creation, b) creating a WordPress account and Wordpress dashboard explanation, c) settings, plugins, themes on WordPress, d) menu, widget, sidebar, category, text, page, comment form on WordPress.

3) Initial Implementation

Limited implementation was carried out in the implementation of the blended learning model with a sample of 2 students enrolled in the Web-Based Learning course in Education Technology Study Program S2 PPs UNP. The results of the development are applied in learning to find out its effects on the quality of learning which includes attractiveness, and learning efficiency. The number of practicalities obtained from 2 students covering 10 aspects of assessment was 91.25%.

4) Formative Evaluation

a) ModelValidation

Validation by the learning model expert, the results obtained with the validity criteria then the blended learning model is very valid for Web-Based Learning courses and general assessment by the validator of the blended learning model of Web-Based Learning courses can be used without revision. The total score obtained is then summed and averaged so that the validity value of 99.07% is obtained.

b) Validation of Learning Materials

Validation by learning material experts, the results obtained with the validity criteria then the blended learning material is valid for Web-Based Learning lectures and the general assessment by the validator of the blended learning material Web-based learning courses can be used with revisions. The total score obtained is then summed and averaged so that a validity value of 75% is obtained.

c) Learning MediaValidation

The recapitulation results obtained with the media validity criteria in the blended learning model are very valid for Web-Based Learning lectures and the general assessment by the validator of the media blended learning Web-Based Learning courses can be used with revision. The total score obtained is then summed and averaged so that a validity value of 93.5% is obtained.

d) Language Validation

Validation by linguists, the results obtained with the criteria of validity, the language in the blended learning model is valid for Web-Based Learning lectures and general assessment by the validator of the language of blended learning Web-Based Learning courses can be used with revision. The total score obtained is then summed and averaged so that a validity value of 84.37% is obtained.

b. *Concurrent Design Stage* II

Concurrent Design Stage Phase II, the researcher did not carry out the design, development, limited implementation, and evaluation stages because the validity and limited implementation stages of the research product did not have too much improvement. Based on the general assessment by the validator of the product

being developed provides an assessment of the product can be used without improvement and little improvement. The following items are based on product improvements suggested by the validator.

4. Full Implementation

The full implementation stage is carried out to see the practicality of the blended learning model that was developed. The purpose of the practicality test is to find out the ease of use of the blended learning model in the Web-Based Learning course. Practicality tests conducted on lectures using the blended learning model in the form of lecture material, video conferences, discussion forums and evaluation of learning questions on the blended learning model.

When online learning takes place, there are learning steps on the course meeting page on the website. The lecturer delivered material that was still not discussed by students during the face-to-face meeting with the online discussion. Furthermore, the lecturer allows students to provide comments for things that are not understood by students or questions and statements needed in the comments column during video conversion. Practicality assessment on full implementation was carried out on 9 students covering 10 aspects of the assessment was 94.7% with a very practical category.

5. Learning Activities

The observed student activities are a) visual activities including 6 statements obtaining an assessment result of 95.83%, b) listening activities including 3 statements obtaining an assessment of 91.66%, c) motor activities including 3 statements obtaining an assessment of 100 %, d) emotional activities including 4 statements getting an assessment result of 87.5%. Getting an average student activity score of 93.75% with very effective criteria.

6. Pre-Test and Post-Test Data

Based on the data analysis techniques of research learning outcomes to conclude whether there is a significant influence from the application of the blended learning model of Web-Based Learning courses, statistical analysis is performed.

Table 1. Pretest and Posttest Data

No	NIM	*Pretest*	*Posttest*
1	18155001	55,68	92,05
2	18155002	56,82	90,91
3	18155003	36,36	94,32
4	18155004	30,68	100,00
5	18155006	57,95	90,91
6	18155007	40,91	89,77
7	18155008	62,50	96,59
8	18155009	36,36	97,73
9	18155012	64,77	100,00
	Total	442,05	852,27
	Averaging	49,12	94,70

7. Normality Test (Lilliefors Test)

Normality test is carried out to find out whether the sample data comes from normally distributed data or not so that analysis can be used using pairing t-test. In the normality test, Liliefors test is used as stated in the data analysis technique.

Table 2. Normality Test Results

Tes	L_{count}	L_{table}	Keterangan
Pretest	0,181661	0,271	Normal
Postest	0,189807	0,271	Normal

The Lilies test calculation table shows that the pre-test Lhitung 0.189807 is smaller than the Ltable 0.271 for α 0.05. Thus the pretest value comes from normally distributed data. For the post-test, Lhitung obtained 0.189807 smaller than Ltable 0.271 for α 0.05. Thus the value of the post-test comes from normally distributed data.

8. PairedT-Test

Pairing t-test testing is to find out whether there are significant differences in the values of the pretest and posttest data. IfT_{count}>T_{table}means that there is a difference between the two groups.

Table 3. Paired T Test Results

Hasil T Paired	
Sample	9
DF	8
Critical Limits	0,05
T Tabel	2,306004135
Mean 1	49,11616333
Mean 2	94,69696889
the difference in mean	-45,58080556
the standard deviation of difference	14,10698765
T Count	9,693239979
difference	There is a difference

Seen in the t paired results table, the price of t_{count}> t_{table}, is9,693>2,306. Thus it can be concluded that the learning outcomes of students who take learning with the blended learning model of Web-Based Learning courses are higher than student learning outcomes before using the blended learning model of Web-Based Learning courses, and there is a significant influence of student learning outcomes between after using learning with a blended learning model of Web-Based Learning subjects compared to before using the blended learning model of Web-Based Learning subjects.

IV. DISCUSSION

1. The validity of the Blended learning Model in Web-Based Learning Subjects

Validation for the blended learning model of Web-Based Learning courses was assessed by 4 validators, namely the learning model validator, material validator, media validator, and language validator. Judging from the aspects of the learning model, the validation results show that the criteria are very valid. This can be seen from the order of syntax, social systems, reaction principles, support systems and evaluations contained in the blended learning model of Web-Based Learning courses.

Validation of material aspects, showing valid criteria. The material used is by RPS and SAP based on learning KKNI. Validation of media aspects shows that the evaluation criteria are very valid because the developed media is by the principles of instructional media and all programs contained in the media are going well. While in terms of language, validation results are also obtained showing very valid criteria. The value is given a validator because the use of language is by the correct Indonesian language rules and by EYD. The language used is clear, easily understood by students and is communicative.

Based on the validity in the development of the blended learning model of Web-based learning subjects and previous research, the blended learning model is included in the category of very valid and can be used in the learning process, the authors also strengthen the results of research with research that has been done by the practicality of the blended learning model of the eye Web-based learning lecture.

2. The practicality of Blended Learning inWeb-Based Learning Subjects

The practicality test of the blended learning model of Web-based learning courses is conducted on students and lecturers. The testing of students is carried out in 2 stages, namely limited implementation (2 people) in the very practical category, and full implementation (9 people) in the very practical category. Trials of lecturers are carried out by lecturers supporting subjects to get the results of the assessment in the category of very practical. The aspects assessed in the practicality test are, the ease of the blended learning model of Web-based learning courses.

Based on the aspect of convenience, the values obtained indicate that the blended learning model of Web-based learning courses is easy to use. The blended learning model of Web-based learning courses is easy to operate on computers, laptops, smartphones and there are no obstacles in their use. The use of navigation buttons, writing (material and evaluation questions), video, sound are also easily understood by students and lecturers, so students can use the blended learning model of this Web-based learning course independently. When to use the

blended learning model Web-based learning courses have been designed with the learning process anytime and anywhere.

3. Effectiveness of Blended Learning in Web-Based Learning Courses

The effectiveness of blended learning model products in Web-Based Learning courses is seen from the observation sheet of student learning activities and data from the value of student learning outcomes. Student learning activities are observed from visual activities, motor activities, listening activities, motor activities, and emotional activities in the use of blended learning models for Web-Based Learning courses.

Based on the results of research on the development of a blended learning model for Web-Based Learning courses, the blended learning model for Web-Based Learning courses can facilitate students in implementing learning. Students who do not understand lecture material in face-to-face meetings do not need to feel under-developed compared to other students, because there are still lecture materials that can be accessed through online learning.

The material contained in the blended learning model of Web-Based Learning courses has been summarized from various sources based on a list of references contained in the syllabus of Web-Based Learning courses. Students who still do not understand the lecture material can also open discussion forums that have been provided on the blended learning model of Web-Based Learning courses.

V. CONCLUSION

Based on the formulation of the problem, the objectives and discussion of the blended learning model of Web-Based Learning courses concluded that.

1. The process of developing a blended learning model for a valid, practical, and effective Web-Based Learning course using the learning management system website for Web-Based Learning courses in the Educational Technology Study Program (S2) of the Padang State University Postgraduate Program.
2. The results of the validity of the blended learning model of the Web-Based Learning course for the Web-Based Learning course show the criteria are very valid after validation by the model, material, media and language validator is corrected once.
3. The results of the practicality of the blended learning model of the Web-Based Learning course for the Web-Based Learning course show the practical criteria after the practicality assessment has been conducted.
4. The results of the effectiveness of the blended learning model products Web-Based Learning courses for Web-Based Learning courses show the effective criteria after seen from the observations of student activities and student learning outcomes.

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