Learning Model Development Using Moodle E-Learning Software By Implementing Borg And Gall Method

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ABSTRACT

This research is based on the vastness of Indonesia territory consisting of islands and uneven distribution of population to state education need to follow the development and technological progress which has changed the paradigm of the concept of learning that is conventional.
Currently in the midst of technological advances required variations of methods that provide more opportunities for teachers and students to learn independently by utilizing various sources. Teaching and Learning Process is required by utilizing technological elements and utilizing wider learning resources by not abandoning the conventional pattern of direct guidance from the teacher. LESSON LEARNING AND LEARNING TEACHING to the global world today that has meaning in the learning pattern that contains elements of mixed, combined or combined patterns with other patterns to improve the quality of learning to improve. This concept is often also termed by mixing between e-learning with the conventional so-called blended e-learning. Based on the purpose of this study to produce Learning Device Development model by Using Moodle E-Learning Software in Operating System I Course at STMIK Hang Tuah Pekanbaru which valid, practical, and effective.
This research is a research development (Reserch and Development) by using Borg and Gall design. The subject of this research is the second semester student (two) Information System Study Program and Informatics Engineering Study Program STMIK Hang Tuah Pekanbaru.
The result of this research is the creation of learning tools that are valid, practical, and effective for the course of Operating System I at STMIK Hang Tuah Pekanbaru which is able to improve students' creativity abilities in accordance with validation results from the validators.

Keywords : Blended Learning, Blended Elearning, Elearning, Workplace Learning

1. Introduction

The development and advancement of technology have changed the paradigm of the concept of learning that is conventional. Currently, in the midst of technological advances require variations of methods that provide more opportunities for teachers to learn independently by utilizing various sources. The teaching and learning process is needed to make the most of the teachers' resources and guidelines. The concept of Teaching and Learning in today's global world that has mixed elements, combinations or combined patterns with other patterns to improve the quality of learning. Thisthe concept is often also termed by mixing between e-learning with the conventional so-called blended e-learning. 1

According to Elena Mosa (2006), the thing to be combined is the element of learning in the classroom (classroom lesson) with the online e-learning. In developed countries, the teaching and learning process using blended e-learning has been used by educational providers.

Onno W. Purbo (2002) explains the term "e" or the abbreviation of electronic in blended e-learning is used as a technology for technology support. Soekarwati et al (2002) state: "e-learning a generic term for all technologically supported e-learning tools as phone bridging, audio and video tapes, teleconferencing, satellite transmissions, and the more recognized web-based training or

computer-aided courses." Internet, Intranet, satellite, audio/video tape, interactive TV and DVD-ROM are synonymous to the same time or at different times (asynchronously) Teaching and learning materials delivered through this electronic media have text, graphics, animation, simulation, audio and video and should also facilitate discussion group with the help of professionals in their field.

In the Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 24 of 2012 on the Implementation of Distance Education in Higher Education in article 3 which reads "distance education has open characteristic, self-study, complete learning, using information and communication technology, using other education technology and/or integrated learning of colleges". Here it is clear that distance education can be implemented in Indonesia using existing information technology.

In teaching and learning activities, there are five areas that can determine the success of teaching and learning process (Soemarman, 2010). The five areas of learning are 1. Development of curriculum and organizing materials/learning materials (Curriculum Development and Course Content Organization). 2. Selection and determination of delivery methods/learning (Delivery Methods and Technique). 3. Management of classroom learning (Classroom Management or Activities) 4. Evaluation of learning (E-learning Assessment or Evaluation of Training Performance or Educational Measurement). 5.Selection of teaching materials (Support Material or Media Development).

The development of information and communication technology (ICT) is driven by the development of computer-based technology and internet technology (the 1990s), so that information dissemination and communication traffic have penetrated the boundaries of space and time. ICT has many uses such as PBK (Computer Based Learning) such as the use of LCD media, CD / DVD learning; Web-based learning that utilizes internet or intranet networks, such as E-learning, Teleconference; learning electronic modules such as Movies, Videos, CDs, iPods, Tablets and so on.3

Utilization of various ICT alternatives in the above learning, one another has advantages and disadvantages. The utilization of e-learning has advantages such as 1). Highlights the principle of learning from various learning resources (free) that is not limited space, time and can be done anytime, anywhere. 2). E-learning can minimize the student's psychological impact. 3). E-learning has the opportunity to minimize students' dependence on educators/lecturers. This is as stated by ElangKrisnadi in a discussion at the National Seminar on Science Education and Mathematics at the University of Education Indonesia Bandung dated August 25, 2003, that e-learning based learning can be an alternative technology in the field of education. e-learning can streamline the conventional learning process. Some things to note for e-learning can be interesting and useful is the simplicity, personality, and acceleration. In addition Yuniawati (2006: 11) states, e-learning has an opportunity that can minimize the dependence of students on teachers.

STMIK Hang TuahPekanbaru as one of the high education institutions located in Pekanbaru City, since the day has been trying to improve the quality of learning in their own environment and in Riau Province generally. One such effort is to develop Web-based education services that can be accessed via intranet (LAN) and the internet via cable network connection or through wireless network connections that have been accessed through the site www.stmikhtp.ac.id facilities

that have been installed, among others: Academic Information System Campus (SIAK) online (http://sisfo.stmik.htp.ac.id) purpose specifically for the environment itself, teleconverter facilities and electronic learning facilities (e-learning) that can be used by lecturers for their learning purposes, online journals containing journal from lecturers and students (http://jik.htp.ac.id). Similarly, there are many places,both government agencies (cyber city), business world and educational institutions including several high schools that have provided 24 hours in the city of Pekanbaru.

William L. Coiney. (2009), examines how students' perceptions of different classroom environments between face-to-face programs, online, and blended methods. The study compared student feedback to determine whether blended e-learning environments resulted in higher levels of participation (cathectic e-learning climate), stronger sense of connection to the instructor (professorial concern), more positive feelings about the nature of cooperation of the classroom environment (inimical ambiance), strong perceptions that lectures are intellectually challenging (academic rigor), a better sense that instructors support and the learning is centered at the students (affiliation), and a more positive sense that evaluation criteria and lecture content are more clear (structure) .5

The findings suggest that blended classes provide a better atmosphere of classroom viewing and online classes in generating higher student enrollment rates and stronger feelings connected to the instructor. Both face-to-face and blended class students feel that their instructors are more supportive and student-centered learning activities and have more positive feelings about the nature of the cooperative than the classroom environment than online students. But classes taught online seem to foster a strong perception that the evaluation criteria and course content are more clear than face-to-face and blended classes.

2. Research Method

a. Types of research

Based on the research objectives that have been determined, this research is a research development (Research and Development or Educational Design Research). (Borg & Gall, 1989), where the design and development research attempts to generate knowledge gained from data that systematically derives from what happens.

Research and Development (R & D) according to Gay, Mills &Airasian (2011: 18) R & D in education is "The process of researching the consumer needs and then developing the product to fulfill those needs, it is not to formulate or test the theory for use in schools. "Borg & Gall (1989: 782) and Plomp (2013: 13) argue R & D is" a process used to develop and validate educational products development studies and validation studies. "Plomp (2013: 13) studies aimed at design principles, and validation studies aimed at theory development and validation ".

The products referred to by Borg & Gall (1989: 782) and Gay, Mills &Airasian (2011: 18) 6 are "... not only textbooks, instructional films, and computer software, but also method of teaching, and programs, the product is field tested and revised until a prespecified level of effectiveness is archived ". Educational Design Research is the process of designing and developing a new product in the form of programs, learning strategies and

teaching materials that are then validated. Plomp (2013: 11) describes educational design research as "a research design appropriate to develop research-based solutions to complex problems in educational practice or the like".

Therefore, research development is a research-oriented development of a product that is described and evaluated. The Device Development by Using E-Learning Moodle Software (P3MSEM) on the Operating System I Course I that is valid, practical and effective in learning. Products resulting from this development are 1). Semester Learning Program and Learning Plan (RPKPS), 2). Textbook, 3).Collection of Problems and Answers, 4).Task Draft and Student Work Sheet, 5).Major Guide to E-learning Moodle Software for Lecturers and Students, and 6). Learning Model Book of Learning system model also developed learning tools in the form of RPKPS, textbooks, a collection of questions and answers, task design and student worksheets, manual management software e-learning moodle for lecturers and students, and the book model learning Course Operating I based blended e-learning moodle. The P3MSEM model to be developed must be valid, practical and effective. The phases of the development of the Operating System I model based on the Borg & Gall R & D model. The description of the Borg & Gall development model is described as follows: "Educational research and development (R & D) is a process used to develop and validate educational products. , which consists of studying research findings, the field testing it in the setting where it is used, and revising it to correct the deficiencies found in the field testing stage. "(Borg & Gall, 1983: 772).

In learning technology, a description of procedures and research development has been developed. Borg & Gall (1983) states that the development research procedure basically consists of two main objectives, namely: (1) Developing the product, and (2) Testing the effectiveness of the product in achieving the goal.

The first objective is called a development function while the second goal is called validation. Thus, the concept of development research is more properly defined as a development effort which is accompanied by validation efforts. Borg and Gall (1983: 775) "research and collecting, planning, preliminary form of product development, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, and dissemination and implementation ". Conceptually, the research and development approach includes Borg & Gall (1983: 775).

b. Development Procedures

for the purposes of research and development, a researcher must fulfill the procedural that is usually depicted in a plot drawing from beginning to end. The Learning Device Development by Using Moodle e-Learning Software (P3MSEM) in the Operating System Course I based on Blended E-Learning by using Borg & Gall model are as follows:

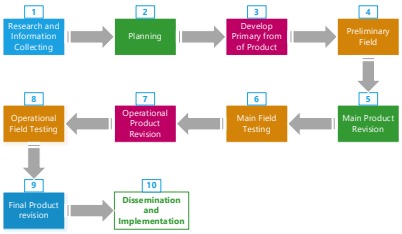

Figure 1 Scheme Development of adaptation outcomes from Borg & Gall development Procedures (Source Borg & Gall, 1983: 775)

c. Test Subject

According to Marczyk, DeMatteo, &Festinger (2005: 18) population is "... all the individual 'subset is called a sample". Taranto's opinion (2010: 255) population is "the whole subject of research". Trianto (2010: 256) describes the sample as "part or representative of the population studied". Sugiyono writes the sample is "part of the number and characteristics possessed by the population". Samples taken from the population must be truly representative. There are things that must be considered in determining the sample, i.e. the sampling technique. The sampling is done by purposive sampling technique

According to Nasution, (2003: 5) purposive sampling is sampling conducted "... on the basis of consideration of his research that considers the desired elements already exists in the sample members taken". The number of samples is determined based on the ability of researchers including time, energy, funds, space/area of observation, and the size of the risk borne by the researcher. The subject of this research is STMIK Hang TuahPekanbaru students, with the population in second semester consisting of 53 students of Information Systems Program students and 32 students of Informatics Engineering Study Program. This population is to see the validity, effectiveness, and effectiveness of the P3MSEM model in the Operating System I Course.

3. Discussion

Needs Analysis of P3MSEM Model

Needs analysis is done by tracing the needs of hardware and software, learning process, needs of learners and hope that will be achieved through the learning process (Prawiradilaga, 2009: 27) 8. Thus, through this needs analysis, problems are identifiedto find the appropriate intervention (Kaufman, Roger & English, Fenwick W, 1979). Therefore, the P3MSEM model development process in the valid Operating System I Course begins with needs analysis consisting of three stages: a). Curriculum analysis; b). Student Analysis; c). Feasibility analysis.

Design Model P3MSEM

According to Gagne (in Nur 2000: 4-5) that in the Direct Instruction Model there are two kinds of knowledge, namely declarative knowledge and procedural knowledge. Declarative knowledge is knowledge of something, a procedural shock is a knowledge of how to do something. However, these two knowledge are inseparable from one another, the Direct Instruction Model is designed to develop students' learning ways of well-structured procedural and declarative knowledge and can be learned step by step.

Building a learning model should take into account the basic elements of the model. According to Joyce & Weil (1982) 6 basic elements of building a model consists of five elements, namely: 1) Syntax, is the operational steps of learning; 2) Social System, is the prevailing atmosphere and norm in learning; 3) Principles Reaction, describes how lecturers should look, treat and respond to students; 4) Support System, is any means, materials, tools, or learning environment that supports learning; and 5) Instructional and Nurtutrant Effects in terms of learning objectives (instructional effects) and outcomes beyond the set (Nurtutrant Effects). Aspects of the builder that serves as

a learning model component of Operating System I based blended e-learning as follows:

The blended e-learning model in the learning activities has an online learning stage that uses web learning and face-to-face learning done in the classroom. Like the following picture:

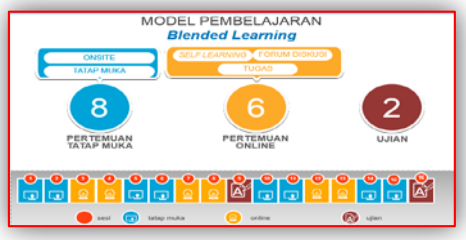

Figure 5 Blended e-learning learning model

While the expected results of blended e-learning learning model of Operating System I subject above can be seen from the picture below:

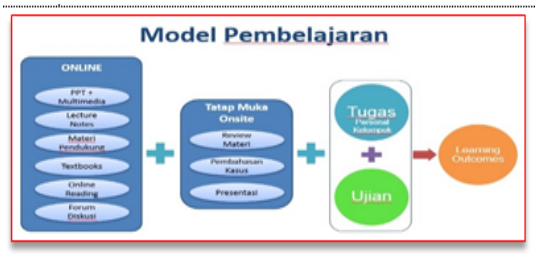

Figure 6 Blended e-learning Outcomes

All online lecture activities should be the same as face-to-face lectures so they are tested and documented and accountable for all existing processes.Validation of P3MSEM model bookin Operating System I Course, Validation of Textbook of Operation System I based on Moodle e-learning software, Validation of Moodle e-learning Software Management Manual for Lecturers and Students and Media Validation Moodle e-learning software can be seen in the following table:

Table 1 Relative Reliability Coefficients and Interclass Correlation About Assessment of Moodle E-learning Software Software in Operating System I Course

Reliability Statistics

Cronbach's Alpha	N of Items
.745	4

Intraclass Correlation Coefficient

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.422[a]	.135	.736	3.922	11	33	.001
Average Measures	.745[c]	.385	.918	3.922	11	33	.001

Cronbach's Alpha value is 0.745 in accordance with the value of 0.6. Means Media Learning Device Development Using Moodle E-learning Software on the Course Operating System I is reliable.The result of intraclass correlation assessment by measuring the scale of ICC on Learning Device Development Media by Using E-learning Moodle Software in this Operating System I Course Course is assessed by the validator. The results of the analysis show the average agreement between rater 0.745 while for one person rater consistency is 0.422.

Model Implementation During implementation, the design of the developed model is applied to the actual conditions. (1) Assessment of practicality Book Learning Device Model Development Using Software e-learning moodle on the Operating System Courses I, (2) Valuation Textbook OperatingThe system I Based Software e-learning Moodle by lecturers, (3)Moodle e-learning Book Management Software Assessment for Lecturers and Students by students, and (4) Assessment of Moodle e-learning Software Learning Media in Operating System Course I.d. Normality Test

Table 15. Test Results Data Normality

	Kolmogorov-Smirnov		
	Statistic	Df	Sig.
Learning Classroom Results	.088	32	.200*
Experiment Classroom Learning Results	.127	32	.200*

The value of significance for the Control Class learning variable is 0.088> 0.05 which means that the distribution data of the Control Class Learning Outcomes is normal. Furthermore, the normality test of experimental class learning results under the significance of 0.127> 0.05, which means the data variables Learning Results Class experimentally distributed normally.This means that the distribution of respondents' answers has the assumption of normality so that it can be used in subsequent tests.e. Homogeneity Test

Table 16. Data Homogeneity Test Results

Nama Kelas	Levene Statistic	df1	df2	Sig.
Kelas Kontrol	1.370	7	21	.269
Kelas Eksperimen	1.309	7	19	.299

The above analysis shows that the probability significance value of each variable is greater than 0.05. Thus it means that research data is homogeneous, so it can be continued for hypothesis analysis.

Validity, Practices, and Effectiveness of the P3MSEM Model

1. Validity of P3MSEM Model
   The result of validity test of learning model of E-Learning Operating Mathematics Course I show that research product is feasible to be used. Some other arguments supporting the validity test are the fundamental aspects of the modeling model, ie the consistency between the expectations model and the reality model. This result is in accordance with an opinion (Nieeven, 2013) 10, the designed model should indicate a logical consistency between the expectations model and reality. Hope means that the model will be usable. Actual or reality means that the model can be used.

2. The results of this validity test have been evaluated by Tessmer (1993) is Expert Review. According to Tessmer (1993), the product performed by expert validation has a better degree of resistance than other techniques. But the product that has been done by expert validation must be revised.11Third, the validity test results show that the products have been produced. Then validation of content and construct validity to the product. According to Nieeven (2013), the state of the art aspect is also called that the content of validity and consistency of various components are logically related to one another as a construct validity.

   The practicality of the task draft book and student worksheet; (e) Practicality of moodle e-learning software management book for lecturers and students; and (f) The model book of learning in Operating System Course I. The test results of these six aspects show good and practical values (very practical). This result also shows the fulfillment of the quality of the learning model that has been selected and defined in the method of development.12

3. Effectiveness of P3MSEM
   The effectiveness test is based on student learning outcomes. The result of empirical value indicates that n = 32, minimum score = 55, maximum score = 95, span = 50, interval = 5, mean = 67,33, standard deviation = 13,047. While based on experimental class research data on

learning of Operating System I course with n = 32, minimum score = 46 maximum score = 95, range = 35, interval = 5, mean = 78, standard deviation = 10,212.

Before performing the hypothesis test, testing the distribution of control and experiment class values. Normality test on the distribution of control class data and experiment class. From the analysis results obtained static 0.088 with significant 0.200 in the control class and 0.127 static with significant 0.200 in the experimental class. Because of the magnitude of 0.05 then the distribution of the two classes is normal. While homogeneity test of both classes. Homogeneity results from significant 0.269 and 0.299. Because of the large significance value of 0.05, then the two classes are homogeneous.

Hypothesis test using the t-test or average difference test. The result of t-test above shows that thing = 3.751> table = 1.72 at significant level $\alpha = 0.001$. It means that H0 is rejected and H1 is accepted. Thus the hypothesis that states the difference Student learning outcomes Class Control with learning outcomes Experiments Operating System I based on E-Learning is acceptable.This is also indicated by a significant level of 0.001 <0.05 which means there is a significant difference between the control class learning outcomes and the experimental class of E-Learning Operating System I Learning Course. Based on the results of effectiveness can be concluded that the development of the model of Operating System I e-Learning based course is already effective.13.

4. Conclusion.

Based on the results of discussion and development, it may be concluded as follows:

1. Practicality of P3MSEM Model
   The practicality test is based on the aspects of (a) the practicality of the RPKPS book; (b) Practicality of the Textbook; (c) Practicality of the Book of Problems and Answers; (d) The development process for generating this P3MSEM model through Borg & Gall's development steps. The resulting learning model is (a) RPKPS; (b) Textbooks; (c) The Book of Problems and Answers; (d) Student work plan and student worksheet; (e) a Moodle e-learning software management book for lecturers and students; and (f) Learning model book of Operating System Course I. Blended e-learning based moodle with blended e-learning that has been made has been testedenvironment. Students have a variety of learning resources, learning does not go on monotonously. P3MSEM helps students to develop their intellectual potential or direction of the lecturer to a minimum. P3MSEM is effective to improve student learning outcomes individually or in groups. The effectiveness of the use of this model is compared to many factors, such as student involvement and lecturer guidance is packed well in the learning process. Lecturers as managers of the learning process create an active student atmosphere by preparing learning tools, using the media, applying electronic learning, using varied learning resources. The role of KEMENRISTEKDIKTI and Universities in the application of this model is necessary. This role is important so that the needs of learning implementation facilities can be available well on campus.

2. Suggestions
   Learning model of Operating System I Learning E-Learning Course as a product of this research can be used and implemented in learning because: a). This research product has E-Learning based learning principles so it is easy to use. So that this model can be applied thoroughly it is necessary to conduct computer operational training so that lecturers and students have computer skills as a prerequisite for the use of this model. b). Need improvements web/portal campus

for this model can be utilized better. c). The use of this model in learning will have the effect of producing learners who have the creativity and ability to take advantage of existing opportunities. This is not separated from the role of lecturers Operating System I course so that required further training to improve the ability of lecturers.

Other research can conduct further research of E-Learning Operation I-based learning model in other fields and materials.

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