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DEVELOPMENT OF WEB-BASED LEARNING MODEL IN THE COURSE DIGIAL ELECTRONIC AT THE TECHNICAL DEPERTMENT, STATE UNIVERSITY OF MAKASSAR

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ABSTRACT

The objective of this research was to developed web-based learning model for digital electronic based on the model Brog and Gall. the results were validated trough the class and resulted in increasing the student's competence on digital electronics course a he technical department of Makassar state university. learning packages comprised: 1) a computer based learning course in the form of software that can be downloaded through http://www.tp-elkadigial.org/, 2) guidelines for lectures, and 3) guidelines for students.

key Words: web-based instruction, digital electronics course, increasing competence, learning package

1. INTRODUCTION

The National Education System works to develop the ability and character forming the nation's dignity and civilization in the framework of the nation's intellectual life. UURI [1] Article 4, paragraphs 1 to 6 stated: 1) Education was held in a democratic and fair and not discriminatory to uphold human rights, religious values, cultural values, and diversity of the nation, 2) Education held as a single unit a systemic open system and multipurposes, 3) Education was held as a civilizing process and the empowerment of learners that lasts a lifetime, 4) Education organized by giving the example, will build and develop the creativity of learners in the learning process, 5) Education organized by developing the culture of reading, writing and numeracy for all members of society, and 6) Education organized by empowering all the components of the community through participation in the administration and quality control of education services. Learning should not be given by the lecturers, because the learning activities can be done by designers and developers of learning resources, such as a learning technologist or a team of experts consisting of media experts and expert materials or content of the material. Various learning approaches can be helpful in achieving learning goals, and accommodate student backgrounds and abilities. Learning activities should be determined based on student characteristics, course characteristics, and consider the various obstacles that may be encountered in the presentation of lecture material.

Education is a process that lasts a lifetime (long-life education). This principle if implemented consistently will be able to influence the curriculum quickly, which no longer contain the material and the tradition is to know, but cored on tools to develop knowledge and technology further. Education can take place anytime and anywhere, which is when and where appropriate to the circumstances and needs of students. Lu'mu [2] observed that one of the required students at Department of Education Electronics Engineering (PTA) Faculty of Engineering (FT), State University of Makassar (UNM) is the ability to digital electronics materials, which can be obtained through a variety of learning resources. But the reality facing today in the FT PTA Programs UNM shows that one source of learning is a web-based learning model. The lecturers believed that this web-based learning can help the success of the learning process with a good digital electronics (interviews with Faculty and Chairman of the Department of PTA FT UNM, June 2009).

Miarso [3] stated that learning is a deliberate effort, aims, and controlled so that others learn or change are relatively sedentary in others. Gagne and Briggs [4] argued that learning consisted of a set of events that affect students such that there is a process of learning. Learning undertaken by students in particular learning Digital Electronics can certainly improve their competence. Understanding of the model in this study refers to the definition expressed by Miarso [5] that the model is a representation of a process in graphical form and/or narrative, by showing the main elements and structure. Framework for Web-based learning model was developed based on the theoretical framework of learning Reigeluth and Merrill [6] who said that there are three main components that must be considered in developing learning models, namely: 1) learning conditions, 2) teaching methods, and 3) procedure of learning activities. Next Santrock [7] supported that the students who follow the web-based learning needs to have a learning principle of self regulation, which bring students and monitor their own thoughts, feelings, and behaviors to achieve a goal. Then Bloom [8] stated that a thorough study of theory and philosophy in membelajarkan and learning associated with learning strategies. David and Sorrell [9] advised through a thorough study of students learning to master the learning materials, standards of conduct so as to achieve the learning objectives previously defined, in accordance with the speed and way of learning.

Web-based learning model also adheres to the principle of networked learning. Nabbagh [10] showed the relationship between long-distance learning (distance learnening), networked learning (online learning) and web- based learning. Then Miarso [3] said that education is open conceptually provides the opportunity for anyone, at any age, to obtain any education, than anything and anybody, whenever needed, anywhere, any way possible, as well as with various patterns that complement each other. Eggen and Kauchak [11] suggested the definition of learning based on cognitive perspective, that is: learning is a change in mental structure that gives individuals the capacity to demonstrate change. Next Fosnot [12] suggested the definition of learning according to constructivist perspectives. Reigeluth [13] suggested that

learning outcomes are observable behaviors that demonstrate the results of one's learning, and Gagne and Briggs [4] said that the results obtained by studying the ability of a person after he followed a specific learning process.

Definition of information systems according to Hall [14] is a series of formal procedure in which the data are grouped, processed into information, and distributed to users. According to Alter [15] it includes information technology hardware and software to implement one or a number of processing tasks such as data capture, transmit, store, retrieve, manipulate, or display the data. While Martin [16] defined information technology is not just limited to computer technology (hardware and software), but also includes communications technology to transmit information. Furthermore, Lucas [17] stated that information technology is any technology that is applied to process and transmit information in electronic form. Then Snelbecker [18] said that based on information theory in mind that the delivery of information from sender to receiver, put the concept of understanding and information processing operations are defined as sentences that can be understood. Website is a collection of Web pages associated with other files that are interrelated. According Santrock [7] the web is a hypermedia information retrieval system that connects various internet contents, including text and graphics. In a website there is a page known as the home page. Jhonsen [19] said that the home page is a page that was first seen when someone visits a website.

Digital Electronics is a vehicle and the development of calculators, computers, integrated circuits, the binary 0 and 1. Team Lecturers of UNM FT PTA [20] stated that the contents of the subject matter of digital electronics in the curriculum department FT PTA UNM broadly divided into eight sub-sections: 1) number system, 2) logic gate, 3) logic technology: 4) registers bistabil and slide, 5) counter and timer, 6) memory device, 7) password; and (8) analog and digital conversion. Richard [21] said that nearly everyone has been accustomed to use the decimal system, or denary, ie with a base 10 number system, which has 10 pieces of symbols, namely 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Abdul Kadir and Terra CH. Triwahyuni [22] stated that the system used to encode the characters there are many macamk, namely ASCII and ANSI. Logic gates by Roger (23) is a two-state devices, ie zero volts which states logic 0 (or low) and a fixed voltage which states the logic 1 (or higher). Furthermore, Alan B. Marcovitz [24] said the basic logic gate consists of, AND, NAND, OR, NOR, NOT, XOR, EXNOR. The basic form of digital circuit blocks, and each is a logic gate. We will use logic gates to binary operations, which raised the term binary logic gates.

Presentation strategy learning is web-based digital electronics means or effort to achieve a goal of learning. Web-based learning is the result of integration of information technology into education, therefore, the students will interact with friends, and lecturers in various ways based on the nature of the task and preferred learning styles are different for each individual. This can be done with a web-based learning model. The concept of web-based learning in the Digital Electronics Course in line with the opinions Miarso [3] about the

education which is open conceptually provides the opportunity for anyone, at any age, to obtain any education, than anything and anybody, whenever needed, in anywhere, any way possible, and with various patterns that complement each other. Therefore it is very important to develop a web-based learning model in Digital Electronics Course.

2. MATERIALS AND METHODODS

This study aimed to develop a web-based learning model in the Digital Electronics course, conducted in the Department of UNM FT PTA for six months from January to July 2009. The object of this study was a Web-based learning model is designed for learning digital electronics. The subjects of this study were students who follow courses of digital electronics.

There were two types of instruments used in research and development of learning models of this Web- based digital electronics, namely: 1) grains of questions for the observation and interview, 2) grains of questions and statements as outlined in the questionnaire include: a) to test the preliminary research instruments; b) for preliminary research, c) for formative evaluation, including: evaluation of peers, evaluation experts, and evaluation of a limited scale.

Data collected in this study were qualitative and quantitative data. Source data were students, professors,laboratory assistants, laboratory chief, and chairman of UNM's Department of PTA FT. To capture data obtained from students related to web-based learning model in the course of digital electronics, developed the research instrument that was adopted from an instrument in his dissertation research Rinderiyana "Development of Virtual Models in the Framework of Mastery Learning Writing for Teachers Popular Trustees" in 2009 and Laksmi Nurharini in his dissertation "Development of a Model Course in Marketing Management Tutorial for Students Open University (UT)" in 2006. Instrument is used as a reference in the development of the observation sheet, interview guidelines and questionnaires in this study.

Qualitative data analysis described in the form: narrative text and images. Data analysis techniques trial results in the development of web-learning model were descriptive. Data obtained using the formula described by the following percentages: the percentage of answers = finx 100%. f = frequency of subjects who chose alternative; n= total number of subjects.

3. RESULTS AND DISCUSSION
3.1. Conceptual Model

Conceptual model is a manifestation of the conceptualization of the theories and principles underlying the design of web-based learning in the Digital Electronics course, described as an algorithm. Conceptual model in the design of this learning system is to use a model Addie namely Analysis, Design, Development, Implementation,and Evaluation. Stages are:

The first step, the analysis of performance analysis and needs analysis or needs assessment. The second step is necessary to clarify the learning program designed so that the

program can achieve the goal of learning as expected. The third step, namely the development activities include make, buy, and modify teaching materials or learning materials to achieve the learning objectives that have been determined. The fourth step, implementation is the realization of the design and development of learning models, whose main purpose is to guide students to achieve learning objectives or competencies. The fifth step, evaluation of knowing: 1) student attitudes towards learning activities as a whole, 2) an increase in self-competence is the impact of student participation in learning programs, and 3) the perceived benefits by the College as a result of increased student competence after following the program of leaming.

3.2. Procedural

This model embodies the seven stages of design and development of web-based learning in the Digital Electronics.

3.3. Physical model

Physical model of the physical form of a web-based learning products in the digital electronics course that can didounload on http://www.tp-elkadigital.org/ address, consisting of 1) teaching materials that can be downloaded; and 2) to guide faculty and students.

3.4. Results Evaluation and Revision Products

Evaluation of the field of peers Digital Electronic Materials, Information Technology (IT), and Technology Education which takes place during the design model of learning takes place. They advise the look and layout. Furthermore, the response of the Expert Content Very feasible, an alternative learning alongside face-to-face lectures. Experts TP: It meets the learning needs of students regarding both the goals, presentation and follow-up from the description presented. And expert IT: learning is very effective, efficient and attractive. Effective because of the self-learning and anytime, free leaming, providing ample opportunity in an attempt to understand learning with the target completely. Efficient in terms of time and interest in learning is also felt to look when we access this learning. After getting feedback from peers and experts, will be revised product.

3.5. Trial Results

Implementation stages of product development learning model of web-based Digital Electronics course, is the stage of field trials. To collect data that can be used as a reference in determining the level of effectiveness, efficiency, and appeal of Web-based learning model the digital electronics course. Implementation of field trials was conducted in two phases, namely the limited scale of the first stage of evaluation by 10 respondents, conducted on June 30, 2010. The result is 1) Students can quickly access the web learning digital electronics through www.tp- elkadigital.org, 2) Students are easy to find material in digital electronics online

learning, and 3) In general, the technical problems that students perceived little such as logging slow because password is incorrectly entered, the Internet network disconnected. And the limited scale of the second stage of evaluation by 25 respondents, conducted on July 2, 2010. The result is (a) Students can quickly access the web learning digital electronics through www.tp-elkadigital.org: (b) Students are easy to find material in digital electronics online learning. (c) In general, the technical problems which students felt just a little bit like login is slow due to enter the wrong password, an internet connection is lost, (d) The purpose of learning is presented to help students, (e) Guidance lecturers help students, (0) Lecturer of the time to chat with students, (g) Lecturer proofread and provide feedback as soon as possible (h) Facilities discussion forum can be used by students, and (i) facilities can be utilized chats between students.

Student Learning Outcomes through the Web-Based Learning Digital Electronics Course (Effectiveness, Efficiency, and Fascination)

Score respondents' assessment of learning results showed that the average score of 3, meaning easy to understand and motivate more students than before to follow web-based learning courses of digital electronics. Data from pre-test and post-test respondents showed an average pre-test web-based learning in a digital electronics course at 9.317, with a standard deviation of 1.535, average post-test web-based learning in the course of digital electronics with a standard deviation of 6.715 of 2.658. It can be stated that there are significant differences between pre test and post test learning web-based digital electronics. Thus, the model of learning was effective by web-based digital electronics. Efficient trial results in this study demonstrated the students accessed to learning digital electronics over the web anywhere and anytime as their respective conditions, which are known from observations through the logs and work about post-test. While the appeal, judging from the tendency of students to open a web learning www.tp-elkadigital.org digital electronics, and continued to read the material, do the tasks independently, and test competence, especially in the interest of student learning.

4. CONCLUSION

Process design and development of web-based learning model in the Digital Electronics course was effective using research and development Lecturers can design and develop web-based learning models. In the digital electronics course one can follow the following 3 steps. First, the conceptual model used five stages, namely analusis design, development, implementation, and evaluation. Second, procedural model used procedure Borg and Gall, with seven steps. Third, physical model of the web-based learning products in the digital electronics course can be downloaded on http://www.tp-elkadigital.org/.

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