DEVELOPMENT OF ELECTRONIC MODULE BASED ON 3D PAGEFLIP PROFESSIONAL IN SUBJECT EQUIPMENT MACHINE PICTURES

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Abstract

This research is a development research consisting of two development models, namely: (1) Multimedia product development model according to William. W. Lee & Diana Owens and (2) Evaluate the development using Rowntree. The development of this electronic module was adopted from the development steps of Owens & Lee which have five stages as follows: (1) analysis consisting of field studies & needs analysis in the basic competency learning process for installing electricity lighting and wiring systems; (2) product design consists of: determining media specifications, creating a flowchart, determining learning strategies, determining the software to be used; (3) product development; (4) implementation; and (5) evaluation. The results of this research are from the assessment of media experts and material experts about the feasibility of this electronic module, in terms of the display aspects of 31 average 4.43 with very good criteria. Programming aspects amounted to 32 with an average of 4.57 criteria Very Good, learning aspects amounted to 37 average 4.63 with very good criteria, and material aspects amounting to 50 average 4.55 with the criteria Very Good. While the results of the assessment of students field tests on aspects of the display, on the aspects of programming, on aspects of learning, and on the aspect of content has an assessment of 847 on average 4,405 with the criteria of "very good".

Keywords: Development, Interactive Multimedia.

INTRODUCTION

The development of vocational education requires knowledge of social organizations, customs, local culture where students live and develop. In the onslaught of the global culture of vocational education must have clear direction, identity and a strong grip. The concept of vocational education in the context of Indonesia can be traced from the thoughts of Ki Hadjar Dewantara with the expression mungelmu without the practice of kothong, the practice without short ngelmu which means science without applying skills is empty, whereas skills without supporting knowledge / theories become stunted (Hadiwaratama, 2005) .

Mechanical Engineering Education Study Program of the Teaching and Education Faculty of Sriwijaya University (FKIP Unsri) is a vocational and vocational education institution that aims to produce prospective students who are able to compete in the world of work, besides having quality and capabilities that can be designed in industrial world or in the world of vocational education. In practice vocational educators strive to provide the best learning process services in accordance with the demands of legislation and the applicable curriculum so as to be able to create competent graduates.

The success in creating graduates who are competent and have high abilities does not escape the role of lecturers and facilities that exist in the learning process at school. The learning process plays an important role in producing competent and professional graduates. Finch and Crunkilton (1979) in (Soenarto, 2015), say that: "The quality of vocational education applies a double measure, namely quality according to school size or in-school success standards and quality according to out-of-school success standards."

Many obstacles are obstacles to the smooth running of learning activities. Based on observations during the learning activities the machine drawing subjects obtained results include: (1) the low quality of student learning in learning media subjects; (2) most students still have difficulty understanding the material presented; (3) the method of delivering the material carried out in this learning process is still oriented to the lecture centered learning approach; (4) the way in which the material delivered by lecturers in the learning process is still too monotonous; (4) students are mostly bored and don't pay attention to their lecturers; (5) lack of teaching materials to be used in this learning; (6) lack of learning resources in this learning media course; (7) Student learning outcomes are still relatively low; (8) Student activities in this learning activity just sit down, listen to explanations, take notes and memorize the material provided so that students are mostly bored and not paying attention.

The use of learning media in learning is important to achieve the instructional objectives that have been compiled. According to (Hamalik, 2009: 12), learning media is a tool, method and technique used in order to more effectively communicate and interact between instructors and students in the process of education and teaching in schools. Learning media is also the most important element in the learning process. Learning media is a tool or material used in the learning process that contains information and learning messages.

One solution to solving the above problems is by doing electronic mode development. The development of electronic modules as learning media is an effort to provide learning convenience to improve the quality of learning so that more interesting learning is created in the classroom. Therefore, Hamalik (1986) in Arsyad (2014: 19) suggests that the use of learning media in the teaching and learning process can generate new desires and interests, generate motivation and stimulation of learning activities and even bring psychological effects to students.

A series of problems faced by students and lecturers in the learning process requires problem solving so that learning activities can run effectively and efficiently so researchers are interested in developing instructional media entitled "DEVELOPMENT OF ELECTRONIC MODULE BASED ON 3D PAGEFLIP PROFESSIONAL IN ENGINEERING PICTURES IN EDUCATIONAL STUDY PROGRAMS MECHANICAL ENGINEERING".

METHODS

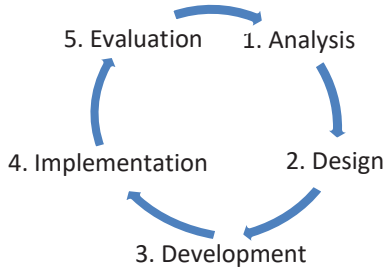
Development style

The development model used in this study consists of two development models, namely: (1) Model of multimedia product development according to William. W. Lee & Diana Owens and (2) Evaluation of development using Rowntree. The use of these two

models is considered appropriate to be used in this development research by considering the time and ease of application. The model for developing the electronic model of machine drawing subjects is only done until the development stage, material expert test, media expert test, one-on-one trial, small group trials and product field trials as Electronic Module products in Machine Drawing in the Study Program Mechanical engineering education.

Development Procedure

The development procedure used in the development of this electronic module is a joint procedure adopted from the development steps of Owens & Lee which has five stages as follows: (1) analysis consists of field studies & needs analysis in the basic competency learning process for installing electricity lighting and wiring systems ; (2) product design consists of: determining media specifications, creating a flowchart, determining learning strategies, determining the software to be used; (3) product development; (4) implementation; and (5) evaluation. His evaluation on this development adopted the evaluation steps for development from Rowntree. Following are the procedures for developing electronic modules based on 3D Flippage Professionals in machine drawing subjects:



Pigure 1. Development Procedure

Trial is the most important part of research development. Trial is a formative evaluation activity that is carried out by asking for help from others to try the product being developed. Other people who are asked for help are usually referred to as respondents. The purpose of the trial is to get direct feedback from prospective users about the weaknesses in the quality of media products that are being developed as a basis for revising products.

Product validation subjects are 2 experts, namely material experts and media experts. Material experts from lecturers who apply to Gmabra Mesin subjects while media experts are people who understand or understand the design of electronic modules developed.

While the subject of testing the Electronic Module product in this development research was students. Data collection is divided three times with different students.

Instruments used to collect data in the form of assessment instruments to assess products that have been developed both from the material aspects, learning aspects, aspects of display and programming. The instruments of data collection are in the form of material expert and media expert validation sheets, student response sheets, teacher

assessment sheets and tests. These instruments are used to evaluate the quality of 3D Flippage-based electronic module products Professional engineering drawing courses. The types of instruments used in this study were questionnaire instruments in the form of assessment sheets in the form of validation sheets containing assessment items for each aspect, both aspects of learning, content / material aspects, display aspects and programming aspects that would be filled by media experts, material experts.

Data obtained through research instruments are used to assess the quality of products developed. Data in the form of (quantitative) scores obtained will be analyzed qualitatively by using a scale 5 conversion reference. The results of this study are in the form of assessment of material experts, media experts and subject teachers on product quality developed in terms of material content, learning, display and programming.

Validation of electronic modules is carried out by material validators and media validators. The results of the validation questionnaire and the validator assessed are presented in the form of validity tables. Expert validation questionnaire data were analyzed using quantitative descriptive techniques. According to Mulyatiningsih (2011: 37) analysis of quantitative data is a measurement scale that can determine the type of statistical analysis used.

RESULT AND DISCUSSION

As the research procedure stated in Chapter IV, this research and development consists of 5 (five) main steps, namely: analysis, product design, product development, product implementation and product evaluation.

Product anasilis

Field analysis is done to see the condition of the lecture process directly (observation). The results of the field analysis include: (1) the lack of enthusiasm of students in participating in learning because the delivery of the material is only conveyed using media books and chalkboards; (2) educators only rely on variations in teaching methods, namely lectures, demonstrations and discussions; (3) educators have difficulty in delivering machine drawing material; (4) narrow image space and not yet functioned optimally; (5) lecturers and students have difficulty in obtaining media in accordance with the material; (6) lecturers and students need media that are in accordance with current conditions, which can attract students' attention; (8) lecturers and students need one of the media so that they can support the learning process contained in the material in the book media.

Analysis of the needs of students shows some opinions and comments of students about the learning process of drawing this machine. They argue that they have not had much more varied learning experiences. The learning method that is more often used by lecturers in delivering lesson material is lecture. The use of learning media in the delivery of material is still very lacking. Sometimes lecturers use the media when delivering material but have not made students' attention increase because the media used only in the form of powerpoints is not interactive. students have difficulty in absorbing the material delivered by lecturers even though students must really understand the material presented

because after finishing the material they will continue related courses namely CAD / CAM.

The lecturer needs analysis also explains the machine learning process that occurs in the classroom. The opinions of students who experienced problems in the learning process of machine images above were also guaranteed by lecturers who were able to study this machine drawing. The lecturer also mentioned that he had difficulty in making learning media that was complete like books but could be taken anywhere. This makes a lot of time wasted and some students still do not understand the explanation given, especially with students sitting at the back. This condition is certainly contrary to the issue of optimizing the use of information and communication technology that is currently developing in the current vocational education environment.

Product Design

The results obtained from the design phase will be used to describe the shape of each display in each frame in the developed electronic module. Learning strategies that will be used in electronic modules include: (1) learning sequences, namely the introduction in the form of instructions for using competencies and expected competencies, presentation in the form of complete material descriptions accompanied by examples and conclusions in the form of questions to understand the level of student understanding based on the material studied ; (2) the learning methods used tend to be individual learning methods because students are faced with their respective computers and the application of complete learning theory; (3) the material used in this electronic module product is a machine image; (4) the form of assessment used in learning using electronic module products is a test of learning outcomes. This test is used to measure the level of ability of students' understanding and completeness in mastering this material.

Product Development

The development of electronic module products as a whole discusses machine drawing material. The target users of this electronic module product are the second semester students who take part in the machine drawing lecture. Multimedia is packaged in two forms of storage, in the form of Compact Discs (CDs) and Flashdiscs.

The initial product that has been developed first is checked before the initial product is validated and tested on students. Checking is done internally which starts with checking the overall course of the program. Broadly speaking, the electronic module product from the development at the initial stage contains:

a. Usage instructions, function to notify users how to use this interactive multimedia.
b. Competence, which contains the formulation of competency standards, basic competencies, indicators and learning objectives.
c. The material consists of 10 material types of material about images that will be taken for 1 semester.
d. Evaluation, contains the practice of drawing questions and practices that have been learned. This exercise serves to check the level of understanding of students about the material they are studying.

e. Profile, which contains the profile of the developer, profile of the media expert, and profile of the material expert.

Product Validation

The electronic product module of the machine image that has been completed before being tested beforehand by the developer; (1) to do the overall components of the electronic module so that the module is declared in accordance with the needs after asking the colleagues to check the module developed; (2) electronic module products that have been developed and examined will then be assessed and validated by material experts and material experts as validators. Validation is contained in a questionnaire filled by both material experts and media experts in accordance with the evaluation aspects of each validator. Initial product validation carried out by one media expert and one material expert. In the validation of the material expert who was the validator of the electronic module product, the lecturer who taught machine drawing subjects at the Mechanical Engineering Education Study Program FKIP UNSRI, while the validation of media experts who became validators in the electronic module product was one of the lecturers in the Mechanical Engineering Education program FKIP UNSRI has mastered about this electronic module learning media. Data evaluation of material expert validators and media experts is used to determine the quality of this electronic module product design. The validator lecturer gives an assessment to be revised until the product is deemed feasible to be tested on students.

Product Implementation

The electronic module products declared feasible by experts will then be implemented / tested on students of mechanical engineering education study programs, FKIP Unsri. The implementation / trial was carried out by 33 students consisting of several stages, namely: (1) the first stage with 3 students called individual trials; (2) the second stage with 10 students called limited trials; (3) the third stage with 20 students called field trials.

Product Evaluation

Products declared feasible by experts are then implemented and assessed by students in the form of trials. The testing of electronic module products at each stage will be assessed by students and revised based on the shortcomings in the product. Suggestions and criticisms from students given at each trial will also be revised to perfect this electronic module. The trial consists of: (1) individual trials carried out by 4 students and they provide an assessment to then the results of the assessment in the first stage will be analyzed to become a revised language; (2) limited trials carried out by 10 students who then also gave an assessment of the products developed and then revised again; (3) after a revised field trial was conducted by 30 students. The results of the assessment of the field trials will be revised final to become the final product.

CONCLUSION

The products produced are in the form of electronic modules based on 3D Professional Pageflip in the Drawing Machine course that are feasible to be used in the learning process in the Mechanical Engineering Education Study Program, Faculty of Teacher Training and Education, Sriwijaya University.

The quality of electronic module products based on 3D Pageflip Professional in the Drawing Machine course is very good.

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