DEVELOPING ELECTRICAL SYSTEM GAME MEDIA ON MECHANICAL ENGINEERING EDUCATION STUDY PROGRAM

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KEYWORDS	ABSTRACT
Learning media Research and development Game media Electrical system Automotive electronics	This study aims to generate a learning media in the form of a game to be used in learning the electrical system and automotive electronics courses. The type of this research is a research and development study. The setting for it is in the mechanical engineering study program at Sriwijaya University. The subject of this research is the learning media which later is developed to be the game media. There are three stages on this research. They are planning, developing, and evaluating. The data collection technique is in the form of questionnaire and interview. The survey is used to find the students' response to the product. Next, the meeting is conducted to probe the problems and deficiencies of the product. Further, the expert validation is also done to find the qualification and validation of the product. The results of this study are (1) based on the evaluation, the expert validation, and the individual trial, the learning media is stated as valid for its design and content aspects which later has several revisions based on the suggestion and the comment from the expert and the students. (2) The small group evaluation stage, it gets the questionnaire score for 79.16%, and from the field trials evaluation, it receives the percentage score for 81.24%. Therefore, the developed game media from the researchers can be considered as suitable to be used in the learning process.

INTRODUCTION

Education is a process to shape the fundamental skills intellectually and emotionally to nature and human beings John (Dewey in Hasbullah, 2008, p.2). Ki Hajar Dewantara (Hasbullah, 2008, p.4) states that education is the growth of the children, which means that it guides those children so that they as a human being and the member of the society can get the security and the happiness as high as possible.

The rapid development of information and technology gives a huge impact on many aspects of life. One of them is education. In the education field, a computer is considered as the tool that is used a lot in the learning process. From several researchers, it can be known that the use of media especially computer can increase the students' achievement and motivation to learn.

Further, on the electricity and automotive electronics course, the lecturers and the students are actually already used the computer as the media on their learning. However, it has not able yet to make the students engaged in the learning process. Based on the students' interview result, it says that the lecturers' media (powerpoint) is not innovative and monotonous in the learning process.

On the level of university education, students need a computer as the supporting device to learn. They use it to do their work, research, and other learning activities in and out the class. The utilization of it is not only as the tool to support their study but also as the media to play a game. It makes the game as the needs on their needs.

The impact of the computer game availability is on the lessening of the students' learning time. From the survey data, it states that 7 from 10 students play a game every day. Based on this result, it shows that game is proven to give the impact on the students learning time.

The nature of the game which is challenging, addicting, and pleasing can have a negative impact if the game that is played is the non-educational one. Therefore, it is necessary to develop an educational game which can be used in the learning process to motivate the students.

RESEARCH METHODS

The type of the study on this research is the Research and Development. A research development study is a method of research that is used to produce a certain product, and also tests the effectivity of it (Sugiyono, 2001, p.297). Further, this research aims to create a game media to find and describe the validity and practicality values of game media on the electricity system and automotive electronics courses in the Mechanical Engineering Education study program in Sriwijaya University.

As the foundation of this game media development, the researchers use the Rowntree developing model. Explained in (Prastowo, 2001, pp. 133-163), the development procedure consists of three stages which are planning, developing, and evaluating

Planning Stage

The planning stage is the first step to find the matter or obstacle on the field. In gathering the data, the researchers conduct an interview with several students and also observe the learning process of the electrical system and automotive electronics courses and also analyze the development potential.

Developing Stage

On this stage the researchers create the product design. The making of it is conducted into two steps which are:
1. Preparation. To make the production process goes well and has a satisfactory result, the researchers have to prepare all of the components. It includes preparing the tool for the media production which is Adobe CS3 software, making the storyboard, and also preparing the material that can support the learning media production process.
2. The product design implementation based on the storyboard then is inserted into the media uses Adobe CS3. This software is designed to have several useful tools which are to integrate text, picture, sound, animation, and navigation buttons. Later, the learning media designed uses the Adobe CS3 in Notebook PC would be the first prototype.

Evaluating Stage

Evaluating is conducted to make sure that the developed media has a guaranteed quality. It means that this process is to find the lack of the media then revises it as an effort to improve the media quality. This evaluation process is done with some phases as what being said by Warista (2008: 240). They are (a) expert evaluation, (b) one-to-one evaluation, small group evaluation, and the field test.
1. Expert evaluation
The expert evaluation is an attempt which is conducted to gather the information about the weaknesses on the learning media and material which is being developed. This is done by ask the opinion of the experts (Warista, 2008: 242). On this step those experts are validated the media. This validation of the design is to assess whether the new product design is rationally will be more effective or not (Sugiyono, 2011: 302). The one who validates the first design (prototype 1) is an expert on the content and media aspects. From this phase, the researchers get the suggestions to revise the designed product.
2. One-to-one evaluation
On this phase the game media product that has been deisgned then is tested to the students who have the high, moderate, and low abilities. As they are considered able to represent the research respondents whether they can understand the media and the material served in the game media or not. From this stage also, the researchers get the responses or comments about the learnjng media that they already designed.
3. Small group evaluation
On the small group evaluation stage, the revised media from the previous stages then is tested to a small group. This is to find the values and practicallities of the developed learning media. There are 10 students involved in this small group evaluation process.

4. Field test

After all of the revision from the previous phases, then there is a field test on the class that becomes the subject of the study to evaluate the developed learning media. Further, this media that already goes to those phases turns out able to produce a practical game media.

Data Collection Technique

The data collection technique in this study includes questionnaire and interview. Below are the process of data collection technique using both instruments.

1. Questionnaire

A questionnaire is a data collection technique which is done by giving a set of questions or written statements to the respondents to be answered (Sugiyono, 2011). In this case, the researchers give the questionnaire to the media and material experts to find the validity value of the game as the media on the electrical system and automotive electronics courses. Moreover, the questionnaire is also given to the students related to the designed media for those courses to find the ease of use of the game media.

The data on the questionnaire is specifically in the form of a checklist. This is done after the small group and field test trials as the base to revise the product of the designed media. Then, the data analysis technique is performed by using quantitative descriptive analysis technique. Later, it describes the result of the product development in the form of interactive computer-based learning media. It also uses to test the validity and feasibility of the product to be implemented in the electrical system and automotive electronics courses. The gathered data then is processed by summed up, and compared with the expected amount and gains the percentage of it (Arikunto, 1985: 140). Later, the formula can be written as follows.

Table 1. The Alternative Answers for Questionnaire Value

Nilai Angket (%)	Alternatif Pilihan Jawaban
81 – 100	Sangat praktis
61 – 80	Praktis
41 – 60	Cukup praktis
21 – 40	Tidak praktis
0 – 20	Sangat tidak praktis

(Modifikasi Purwanto dalam Mersi, D., 2013, p.29)

2. Interview Data Analysis

The data from the interview is conducted openly and structured. Then, it is descriptive qualitatively analyzed. The result from the validation of the product and the one-to-one evaluation is used as the reference to revising the product.

RESULTS AND DISCUSSION

The evaluation is from the 30 students of Mechanical Engineering Education study program year 2013 at Sriwijaya University. Later, the researchers conduct the small group test for 16 students from the total amount of respondents.

The result from the small group test 79.16% which states that the electricity game is practical to be used. Moreover, the researchers also make a field test trial. This trial is given to the 20 students of Mechanical Engineering Education year 2013. They are given the same questionnaire with the one to the small group test. The result from the field test is 81.24% on the range 81-100% which is considered as "very practical". Therefore, it can be concluded that game media that is made by the researchers is feasible to be used as the learning materials for the students of Mechanical Engineering Education study program year 2013 at Sriwijaya University.

CONCLUSION
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Based on the result of the study, it can be concluded that:
1. Since the game media on the electrical system course fulfills the criteria on the validity instruments from the experts, it can be said that it is able to be used as the learning media especially for the students who major on Mechanical Engineering Education.

2. The developed game media on the electrical system course for the Mechanical Engineering Education also meet the criteria for its practicality. This is based on the score for the practicality questionnaire from both small group test (79.16%) and field test (81.24%) scores. Therefore, the average of these scores is 80.20%. This percentage is in the range 61-80% which is included in the practical category.

Suggestion

Several suggestions from the researchers after conducting this research are for:

1. Lecturers: to utilize the game media on the electrical system course. So, the students can use it for their independent learning.
2. The future researchers: to refer to this study so they can make a better learning media which adjusts to the always developing situation.
3. Universities: to utilize the game media on the electrical course especially for the electrical system and automotive electronics.

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