DEVELOPMENT OF ANDROID-BASED LEARNING MEDIA COMPUTER GRAPHICS COURSES

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ABSTRACT

This research aims to develop android-based learning media in computer graphics courses. The research method used is development research with stages of design, production, evaluation, and analyzing data by percentage. Based on several stages of trials conducted to media experts (81.92), design experts (81.7), and materials experts (80). So the overall percentage average value on expert validation obtains good eligibility criteria. For individual scales (88.7), small-scale trials (80.23), and field-scale trials (81.23). So overall the average percentage score in respondents obtained a very good eligibility criteria.

Keywords: *Android; Learning Media; Development; Computer Graphic*

Introduction

Along with the development of technology, has developed augmented reality technology which is the concept of combining the real world with the virtual world. Although the virtual environment on this technology uses computer graphics, the main background of this technology is the environment in real life [1]. Augmented reality technology is familiar, especially in the world of education. Unlike other computing technologies, augmented reality displays or interfaces offer seamless interaction between the real world and the virtual world. But educators must work with researchers in the field to explore how the characteristics in this technology can be applied in a school environment [2]. In addition, augmented reality architecture requires less equipment, it

only needs three pieces of equipment: a camera to capture things from a real environment, a display to see the end result, and a device that provides computing power. So many devices that can meet these requirements include PCs with HMD (head mounted display), tablet pc, PDA (personal digital assistance), and smartphones [3]. As information and communication technology develops today, making the learning process can be done anywhere and anytime such as android-based learning. With the existence of learning media can increase student learning motivation and the possibility of students can learn alone with abilities anywhere and anytime.

However, the use of these technological advances has not been seen in learning. Based on the phenomenon that occurs when learning in the classroom is a process of defense carried out by teachers using only presentation media in the form of power points that contain text only without images and videos. In addition, teachers and students already have android-based mobile phones but have not been used to support the learning process.

Based on the above exposure, there needs to be an android-based learning media in computer graphics courses. The learning media can be used as a learning medium for learners in the computer graphics course, and can be used by educators as a learning medium in the teaching and learning process. In addition, with this application, students are also directed to better utilize the smartphone they have not only to communicate but also for the realm of education.

Method

The methodology used in this research is development research. It is research oriented to develop and validate the products used in education[4]. The development of this android-based learning media uses a procedural model that is descriptive, showing the steps that must be followed to produce the product [5]. The steps of development procedures include: design, production, and evaluation stages [6].

The subjects in this study are in the early stages of validation by experts (design experts, media, and materials) [7]. Then continued individual-scale product trials, small group trials and field tests. The data collection technique in this study uses questionnaires. Questionnaires are used to obtain information and data to measure the feasibility of the resulting product [8].

Finding and Discussion

In accordance with the development steps that have been selected, the following design, production and evaluation are produced:

a) Design stage: obtained the results of the analysis of needs in the form of materials and syllabus subjects in accordance with the curriculum. Continued with the preparation of the script.
b) Stage of production: media developed in the form of audiovisual media that is the incorporation of text, sound, images and animation.
c) Evaluation stage: premaster evaluation consisting of evaluation of experts, individuals, and small groups. Followed by field trials.

The final result in this study is an android-based learning medium that is used as a learning medium. The application consists of interconnected pages, as for the following display:

Figure 1. Cover View

Figure 1 is a front cover view before going into the main view and is the opening part of the beginning of learning. The step that is done to move to the main view is to click the Next button.

Figure 2. Main View

Figure 2 is a display that contains buttons that serve to make it easier for users to run and access the view they want to open. The buttons on the gamabar above are competence, material, evaluation and profile.

Figure 3. Material View

Figure 4. Material View

Figure 3 and 4 displays the material. This page is a sub menu of the main page. In this material page there is a menu to connect to the material in the form of theory.

In accordance with the stages that have been done in the creation of learning media in the form of android-based learning media. It is said that this learning medium was developed in accordance with the computer graphics course learning system.

This android-based learning media has gone through a premaster evaluation stage that begins with experts. For validation or assessment, the design expert is as follows:

Table 1. Assessment results by design experts

Indicators	**Value**
1st	89
2nd	78
3rd	85
4th	84
5th	80
6th	78
7th	77
8th	88
9Th	79
10Th	79
Total Answer Value	**817**
Number of Question Indicators	**10**
Average	**81,7**

Based on the table above, the average design expert assessment result is 81.7. Based on the feasibility scale table, the value is 81.7 bearada at intervals of 75%-89% with the category "Good".

Table 2. Assessments by media experts

Indicators	**Value**
1st	85

2nd	78
3rd	77
4th	85
5th	82
6th	78
7th	79
8th	79
9Th	87
10Th	85
11th	88
12th	82
13th	80
Total Answer Value	**1065**
Number of Question Indicators	**13**
Average	**81,92 ,**

Based on the table above, the average design expert assessment result is 81.92. Based on the feasibility scale table, the value is 81.92 bearada at intervals of 75%-89% with the category "Good".

Table 3. Results of assessment by material experts

Indicators	**Value**
1st	80
2nd	79
3rd	80
4th	78
5th	78
6th	82
7th	78
8th	82
9Th	78
10Th	83
11th	82
Total Answer Value	**880**

Number of Question Indicators	**11**
Average	**80**

Based on the table above, the average design expert assessment results are 80. Based on the feasibility scale table, the value of 80 bearada at intervals of 75%-89% with the category "Good".

Table 4. Scale assessment results (3 students)

Indicators	**Value**
1st	77
2nd	84
3rd	78
4th	78
5th	79
6th	85
7th	78
8th	80
9Th	80
Total Answer Value	**799**
Number of Question Indicators	**9**
Average	**88.7**

Based on the table above, the average design expert assessment result is 88.7. Based on the feasibility scale table, the value is 88.7 bearada at intervals of 75%-89% with the category "Good".

Table 5. Small-scale assessment results (8 students)

Indicators	**Value**
1st	80
2nd	79
3rd	81
4th	85
5th	82
6th	85
7th	80
8th	78

9Th	79
10Th	78
11th	78
12th	80
13th	78
Total Answer Value	**1043**
Number of Question Indicators	**13**
Average	**80,23**

Based on the table above, the average design expert assessment result is 80.23. Based on the feasibility scale table, the value is 80.23 bearada at intervals of 75%-100% with the category "Excellent".

Table 6. Field-scale assessment results (26 students)

Indicators	**Value**
1st	85
2nd	80
3rd	79
4th	78
5th	82
6th	79
7th	79
8th	85
9Th	80
10Th	82
11th	84
12th	78
13th	85
Total Answer Value	**1056**
Number of Question Indicators	**13**
Average	**81.23**

Based on the table above, the average design expert assessment result is 81.23. Based on the feasibility scale table, the value is 81.23 bearada at intervals of 75%-100% with the category " Excellent ".

Conclusion

Based on the results of research and discussion about the development of android-based learning media, namely through several stages, namely expert trial stages and trial stages to the field. The results of premester evaluations conducted by media experts obtained 81.92 with good predicates, design expert evaluations obtained a percentage of 81.7 with good predicates, and material experts rated products made with a percentage of 80 good predicates. So the overall percentage average value on expert validation obtains good eligibility criteria.

After the feasibility test of experts then continued with individual trials obtained an average percentage of 88.7 with a very good predicate, small-scale trials obtained an average percentage of 80.23 with a very good predicate, and large-scale trials obtained an average percentage of 81.23 with a very good predicate. So overall the percentage average score on respondents obtained excellent eligibility criteria.

In the advancement of software technology that has multi-functions for all fields. Like CorelDraw software that has many functions. CorelDraw is one of the vector graphics software applications created by Corel to create a professional work of art, ranging from simple ones such as simple logos to complex technical illustrations with visual processing.

Based on the results of several stages of trials conducted by experts and respondents, it can be concluded that this android-based learning medium is feasible to apply in learning in Computer Graphics courses.

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