

Android-Based EduGame for Elementary Students

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Abstract. This article is a report on the validation stage of Research and Development about Android-based educational games for social studies learning in elementary schools. The aim is to measure the validation of the developed product. This development is carried out with the consideration that instructional media, especially Android-based educational games, help teachers in creating independent, active, and creative learning that in line to the demands of 21st century competence in the 2013 Curriculum. Their use in learning makes learning more effective. The validators are media experts, material experts, and learning experts. The instrument used is a questionnaire for validation from each expert. The data are analyzed using a descriptive-quantitative method. The results show that the media is valid in terms of media, material, and learning. It can be concluded that the learning media for Android-based educational games for social studies learning in elementary schools is feasible to use and can be continued to assess its practicality and effectiveness.

1. Introduction

The development of information communication and technology has given a major impact on the games industry [1]. This euphoria encourages educators to be more creative in designing the learning process by utilizing sophisticated technology [2]. These developments bring about a change in the way of learning, especially for Generation Z children who were born in 1999-2011 and grow in the midst of the internet era. However, the fundamental difference in the mastery of technology between Generation Z and the senior generation often brings gaps in the classroom [3]. Thus, gen Z changes the pattern of learning in the classroom that leads to the use of the internet as a learning aid. In this manner, it is believed that the students will not be bored in learning [4].

Moreover, social studies learning in elementary schools is delivered as an introduction to social interaction and history in the past about social. These materials are boring to learn for children because social studies learning tends to be in the form of memorizing and monotonous. This fact has actually referred to the government rule and all elements related to the world of education. Thus, the government makes policy by revising the curriculum. The teachers are requested to use various teaching methods and adapt to the latest developments in teaching to meet the students' needs[5].

The teachers are also required to provide pleasant learning for the sake of students in order to make them not bored in learning [6]. One innovation that can be done by the teacher is to use learning media during the learning process. The media can be used as a tool or instructional media to deliver learning material [7]. This learning media is very good to use because children will be interested in what teachers give in learning [8].

There are some kind of instructional media that can be used by the teacher in the learning process. One of them is ICT-based learning media [9]. As it was mentioned above that today children are in the 21st century who are referred to as generation Z [10]. The teachers can use media in the form of educational games in social studies learning [4]. Social studies learning by using game can make children more active in learning

Dealing with this matter, one method that can be used is to apply game principles to the teaching and learning process [11]. to make the students feel that they are playing rather than learning. This method is called Gamification. This method is used with the aim of motivating the students and maximizing feelings of fun and engagement with the learning process. The game elements such as giving "badges", highest scores, levels, competition, and others, are believed to be able to make the learning process more interesting [12].

Further, the educational game method by using android in the learning process that was developed in this study is to create interactive elementary social learning software. The students can open the software and choose the various menus they want to learn first. The software will give a score and points for each stage passed by the students as in the game. At certain points, they can go up to the next level [13].

These processes are causing high pleasure and engagement in learning. They will also compete with each other to get the highest score in the class. It can be concluded that this learning method is one of the learning methods that applied the concept of learning by experience in which the students study elementary social studies materials actively, interactively, and pleasantly [14]

In conclusion, using Android game for learning can solve the problems faced in social studies learning in elementary schools and also provide convenience for the teachers in exposing social studies learners in elementary schools. This research is expected to answer the two sides of current educational problems both in terms of teachers and students by developing an educational game media using android. [15].

2. Metode

The research method used in this study was Research and Development (R & D) model that produces a certain model [16]. There were four stages called defining, designing, developing, and disseminating [17]. The defining stage is to establish and define learning conditions that started with the analysis of the objectives of the developed material. Then, the designing stage is to prepare the form of learning media. Next, the developing stage is to test learning media. The last is disseminating stage aims to get the developed learning media to be beneficial for the learning process of social studies in elementary school [18]. More detailed research stages are described as follows:

2.1 Defining

The defining stage aimed to set and define learning conditions. The steps in the defining phase were needs analysis, curriculum analysis, material analysis, media analysis, and student analysis [19].

2.2 Designing

The purpose of this stage was to prepare the materials for the development of learning media products. At this stage, there were two steps that are carried out called Preparation of Materials and Preparation of Evaluation Tests [20].

2.3 Developing

The purpose of this stage was to produce a product that had been revised based on inputs from experts. At this stage, limited trials were also carried out to the students with steps called validity test, practicality test, and effectiveness test [21]

2.4 Disseminating

After the learning media was said to be valid, practical and effective, the final stage of the development of the learning media was the dissemination of the learning media. The dissemination of the learning media was carried out in this study on a limited scale in one elementary school [22].

3. Result and Discussion

3.1 Result

3.1.1 Defining stage

In this stage, the researchers conducted several analyzes, such as the analysis of learning media needs, curriculum analysis, material analysis, media analysis, and student analysis.

3.1.2 Designing stage

After analyzing the curriculum, material, media, and students needs, the researchers began to design interactive multimedia-based map media that were developed and tested on fourth-grade students, including:

- The learning material preparation.
- The evaluation test compiling.
- Media selection, namely educational media using Android.
- Selection of the format by making the design along with the learning media components that will be created.
- Making media designs by creating a flowchart and storyboard.
- Making educational media games using Android.

3.1.3 Developing stage

3.1.1.1 Validity test

The validity test aimed to determine the level of validity of the developed learning media. The aspects of validity test were the aspects of media, material, and language. Each aspect was assessed by validators who were experts in their field called media expert, material experts, and linguists.

3.1.1.2 Practicality test

The primary data of the practicality test for multimedia-based map media was the data obtained directly from the teacher and students using questionnaires. The homeroom teacher and students were included as a trial subject. The practicality test variables were ease of use, benefits, appearance, and time of the developed learning media. The following was a practical test that researchers had carried out in the trial:

3.1.1.3 Effectiveness test

The data of the effectiveness test was derived from students' learning outcomes. These learning outcomes were assessed on the level of the three learning domains, called cognitive (knowledge), affective (attitude), and psychomotor (skills).

3.1.1.4 Disseminating stage

The disseminate stage was conducted in one elementary school. At this stage, the teacher carried out social studies using android-based educational media games. Thus, the data was taken from the result of the effectiveness test. The following was an explanation of student learning outcomes at the stage of dissemination that had been obtained:

3.1.4.2 Cognitive domain

The cognitive domain assessment at the dissemination stage was done by giving evaluation test questions to the students. The average value of this test was 80.53 (Very Good) and got a passing percentage at 90.24% out of 41 students.

3.1.4.3 Affective domain

The assessment of affective domain at the dissemination stage used an observation sheet. This assessment was carried out by two observers, called the guardian teacher. This assessment was carried out during the learning activities using android-based educational learning media. There were three aspects assessed in the affective domain; (1) activeness when learning, (2) caring for the environment and (3) respecting others. Overall, the affective domain learning outcomes at the dissemination stage obtained a total score of 462 with an average value of 75.07

3.1.4.4 Psychomotor domain

The psychomotor domain assessment at the dissemination stage used an observation sheet. This assessment was carried out by two observers, called the homeroom teacher. This assessment was carried out during learning activities using android-based educational learning media. There were two aspects assessed in the psychomotor domain; (1) skills in using media, and (2) discussion skills. Overall the psychomotor domain learning outcomes at the dissemination stage obtained a total score of 333 with an average value of 79.29 (Good).

3.2 Discussion

It can be seen from the result of the study that the development process of android-based educational learning media was in accordance with the 4-D model. This study consisted of four stages called (1) defining stage consisting of needs analysis, curriculum analysis, material analysis, media analysis, and student analysis; (2) designing stage consisting of media design and creation; (3) developing stage consisting of the testing phase, validity test, practicality test, and effectiveness test of learning media; and (4) disseminating stage.

The results of the android-based educational learning media assessment applied in elementary school for social studies subjects had been very good. It can be justified from the results of the media validity test of the media, material, and language aspects. The final aspect test of the media aspect obtained a score of 93% in the very good category. The final validity test of the material aspects obtained a score of 97% (very good). The final validity test for language aspects scored 88% (very good). The results of the practicality test of the media from the teachers and students as a whole had been very good. The assessment of the media practicality test by the teacher obtained a score of 90.70% (very good) and an assessment by 20 students obtained a score of 83.33% (very good).

Moreover, the results of the media effectiveness test can be seen from students' learning outcomes in the aspect of cognitive, affective, and psychomotor domain at the trial stage of the product as a whole showed the good and very good category. The cognitive domain obtained an average value of 81.35 (very good) with a passing percentage of 85% out of 20 students. The affective aspects obtained an average score of 75.40 (good) and the last, psychomotor aspects obtained an average score of 78.60 (good).

In addition, the results of this study indicated that the use of educational media using android-based gave a positive impact on social studies learning in elementary schools. The teaching and learning process that used an educative with interactive android can provide many benefits in the term of efficiency in delivering material and increasing students' interest in learning.

However, the appropriate multimedia-based media had to meet the characteristics of media and multimedia. There were several characteristics in which an interactive multimedia-based map media to be appropriately used: 1) Fixative characteristics that described the ability of the media to record, store, preserve, and reconstruct an event or object; 2) Manipulative characteristics that described the ability of the media to transform an object, event or process in overcoming the problems of space and

time. For example, the process of larvae becoming cocoons and butterflies can be presented with a shorter time (or accelerated by time-lapse recording technique). Or vice versa, an event that can be slowed down to get a clear sequence of events; 3) Distributive characteristics that describe the ability of the media to transport objects or events through space, and simultaneously those events were presented to a large number of students, in various places, with relatively similar stimulus experiences regarding the event.

4. Conclusion

There are some conclusions can be drawn based on the data obtained and discussion of the research data that had been carried out. First, developing an educative with android should be started with conducting needs analysis, curriculum analysis, material analysis, media analysis, and student analysis. After that, the next step is arranging teaching material, evaluation tests, media selection, format selection and initial media design (making flowcharts, storyboards, and media creation processes). Second, the results of the validity test of learning media by media expert, material experts, and linguists reach a very good category. Third, the results of the practicality test of learning media by the teachers and fourth-grade students show a very good category. Fourth, the effectiveness of learning media shows that the learning outcomes of fourth-grade elementary school students have increased with a passing percentage of 85%.

5. Referensi

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