

Educative Learning Media for Elementary School Students

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Abstract: This research is motivated by using instructional media that is less appropriate in social study learning. The purpose of this study was to develop an Android-based educational learning media in social study learning for elementary school students. This research is development research using four D model. The results of this study show that the development of Android-based educational learning media for elementary students is valid, practical and effective. The implication of this research is it can be used as a reference for teachers and education practitioners in using learning media for elementary school students.

Keywords: learning media, edugame, elementary school

I. INTRODUCTION

Current technological development makes it easy for us to make breakthroughs based on science, technology, and innovation [1]. The technology is a smartphone [2] [3]. A smartphone is a device that features computers and mobile devices (cellphones) [4] [5]. Unlike ordinary mobile devices, smartphones have a large amount of storage and local memory. Smartphones have operating units such as computers [6]. A smartphone is a mobile device whose user growth is very rapid and its presence attached to the last few years, especially those with an Android operating system.

Development of information technology has influenced the use of media as a learning tool [7]. One of them is by using Android-based educational games in social study learning. An android-based educational game is a technology that combines various media sources delivered and controlled by the android system through smartphones interactively [8].

Technological progress is not aligned with its application in the education field, especially in social study subject in elementary schools. The use of educational games based on Android in social study learning in elementary schools is still rarely found. Only a few people who do not have this android smartphone. It is known from the observation results by using a questionnaire to 75 of 4th-grade students at elementary school 02 Bukittinggi that 88% of students use smartphones with 45% of them owning it while 55% belongs to their parents. 38% of students spend about an hour a day using a smartphone with 46% of them using it to play games.

From this phenomenon, it is necessary to develop a learning media in their smartphone to support social study material. Besides, other types of media such as educational games can also be used for elementary learning because it is designed along with the characteristics of elementary school students who love to play. Subsequently, students can learn while playing. The android-based educational

game also has practical properties, can be taken anywhere and played anytime. Thus, this Android-based educational game is easy to use by both teachers and students.

Besides, to create a golden generation of Indonesia, this is also needed to prepare students to have 21st-century competence, namely critical thinking and problem-solving skills, collaboration skills, creativity skills, and communication skills [9]. This can be supported by using technology-based learning media [10]. Learning media is one of the factors for learning success. Students can be motivated, actively involved physically and psychologically by using media. It also maximizes all students' senses in learning and makes learning more meaningful [11].

Based on observation made in elementary schools, researchers found problems in social study learning related to learning media used. Teachers use less varied learning media because they only take pictures from the theme book. Next, researchers interviewed the teacher and students. As a result, teachers feel less capable to develop learning media, thus students feel the media used by teachers cannot motivate them to learn.

This fact certainly has a big impact on students. They have difficulty in understanding the material hence they cannot express ideas they have and integrate them in learning activities. This is what causes students less active in learning as seen at the observation time. Therefore, learning outcomes of students' initial test scores are low and do not reach the minimum completeness criteria.

Consequently, to overcome these problems development of innovation in social studies learning process is needed. Innovation developed must harmonize the characteristics of elementary school students, technological development and learning in elementary schools. Accordingly, the best learning innovation to develop is android-based educational learning media. Then, the purpose of this study is to develop educational learning media for elementary school students.

II. METHOD

The type of research is Research & Development. This study used a Four-D (4D) model includes "definition phase, design phase, development phase, and disseminate phase." The definition phase aims to establish and define the learning requirements. The steps are requirements analysis, curriculum analysis, material analysis, media analysis, and student analysis. The design phase consists of material preparation, evaluation tests preparation, media selection, format selection, and initial design.

The development phase consists of validity, practicality and effectiveness tests. The disseminating phase is carried out by distributing research results. Data collection techniques in this study were learning evaluation tests and observation sheets (effectiveness), questionnaires (validity and practicality) and documentation. Data collection instruments use questionnaire sheets to determine the validity and practicality of the product and the test aims to determine effectiveness.

III. RESULTS AND DISCUSSION

Results and discussion of this study are discussed based on four steps of 4d. The discussion is as follows.

A. Definition Phase

Definition phase is a stage for finding and analyzing research problems and solutions [12]. The purpose of the definition phase is to find and establish the basic problems faced in social studies learning for elementary school students. At this phase, the researcher conducted some analysis, i.e learning media requirement analysis, curriculum analysis, material analysis, media analysis, and student analysis.

- Learning media requirement analysis.

The first requirement analysis is an analysis of learning media. This is based on the first observation that teachers teach using inappropriate learning media. Based on observation, the data obtained as follows:

- Low motivation of students towards social studies learning, marked by some students not paying attention to teacher's explanation and choosing to talk with their peers.
- During social studies learning process, teacher is more active in explaining material in front of the class while students passively listen in their seats.
- Learning media used by teacher during social studies learning process is less innovative. Teacher only uses explanation method in front of the class and only uses media by using whiteboards, markers and student books.
- Social learning media in schools have limited availability, the lack of material content contained in books requires students to access other learning resources.

The results of requirement analysis are: (1) students need high motivation towards social studies subjects, (2) students need more activeness during social studies learning process, (3) teachers and students need innovative learning media, (4) students need learning media with maximum content contained and unlimited availability to make it easier to access learning resources.

Learning media is a tool that helps teachers convey information [13] [14]. Good media is media that can

convey information well to students thus students' motivation appears in learning [15]. Learning media can provide a direct and real experience to students and develop an exploratory attitude. Therefore, proper analysis for the development of this learning media is necessary.

- Curriculum analysis

Curriculum analysis is important carried out in the development of learning media [16]. It is intended that learning media can be used in a prescribed curriculum. The curriculum used in the development of instructional media in this study is the 2013 Curriculum (K13). The basic competency taken was social studies subject in 4th grade, namely: 3.2 Identifying social, economic, cultural, ethnic, and religious diversity in the local province as the identity of the Indonesian nation and its relationship with spatial characteristics.

The indicators are included in the development of interactive multimedia-based map media, namely: (1) identifying social diversity in Indonesia, (2) identifying economic diversity in Indonesia, (3) identifying cultural diversity in Indonesia, (4) identifying ethnic diversity in Indonesia, and (5) identifying religious diversity in Indonesia.

- Material analysis

Analysis of learning material is guided by a syllabus of the 4th-grade social studies on the theme of Beautiful Diversity in My Country followed by observing teacher's and student's books. It can be concluded that ethnic material and clothing are not appropriate, inadequate, and inaccurate because it only contains information on 33 provinces. Whereas regional language materials, traditional houses, traditional clothes, and economic activities are appropriate, sufficient, and accurate because they contain information about 34 provinces according to the latest numbers.

- Media analysis

Media analysis conducted by observing school, interviewing and discussing with teachers of fourth grade, namely Sisca, S. Si, and Drs. Zuardi, M.Sc as experts in Education Faculty in Padang state university. Based on interviews and discussions conducted on Monday, February 25, 2019, it was confirmed that the teacher had never used an android-based educational game in social studies learning in elementary school.

He strongly supports the educational game that researchers developed. While interviews and discussions conducted on Thursday, February 28, 2019, obtained information and suggestions that Android-based educational game is still not much developed. He also provides advice and supports Android-based educational games have been developed by researchers.

- Student analysis

Analysis of students conducted to find out the character of students through interviews with teachers of fourth grade namely Sisca, S.Si on Thursday, February 28, 2019. The results are: (1) difficult material makes students bored to learn the social subject; (2) too much diversity in Indonesia makes students hard to understand; and (3) material given feels very difficult because it requires

students to know the diversity of 34 provinces in Indonesia. The results of interview analysis are: (1) students quickly get bored when studying social studies; (2) students find it difficult to learn diversity in Indonesia; and (3) students find it difficult to understand many things at once.

Student analysis needs to be carried out. Learning media must be consistent with the characteristics of elementary school students. In general, elementary school students are in a concrete operational period. The period in which students learn from concrete objects [17]. Therefore, the developed media must be harmonized with the development of students.

B. Design Phase

The design phase is a stage of designing a product based on requirement analysis results [18] [19]. After analyzing the requirement, curriculum, material, media and students, the next phase is the design phase. Researchers began designing Android-based educational games that developed and tested on 4th-grade students, including: (1) Preparation of educational game materials, namely the Beautiful Diversity in My Country by including thematic learning; (2) Compile evaluation test questions using Google Form which can be seen in appendix 5 page 145; (3) Media selection, which is an Android-based educational game by making use of the AppsGeyser site; (4) Format Selection by making a design along with learning media components made. 5) media design creation, namely: Creating a flowchart (see appendix 3 page 119); Creating a storyboard; and (6) Making an educational game based on Android through the AppsGeyser site. After the flowchart and storyboard finished, the next step is to make an educational game based on Android through the AppsGeyser site.

C. Development Phase

- Validity Test

Validity test aims to determine the level of validity of educational games developed [20] [21]. There are three aspects to be assessed, namely: media, material, and language. Every aspect is assessed by an expert validator

in their field. Here are the analysis results: validity test aspects of Media Expert Lecturer Data were obtained from an expert in instructional media, Mr. Bayu Ramadhani Fajri, M.Ds as a lecturer of animation and multimedia, Faculty of Engineering, Universitas Negeri Padang. Validity test is done by providing an assessment of the developed media using a questionnaire assessment sheet. Variable aspects of learning media, namely appearance, readability, ease of use and tests. Can be seen in the following Table 1.

TABLE I. VALIDITY TEST RESULTS (BEGINNING AND END) MEDIA ASPECTS

Variable Criteria	Indicator	Initial Score	Desc.	Final Score	Desc.
Appearance	1	2	KS	4	SS
	2	3	S	4	S
	3	4	SS	4	SS
	4	3	S	4	SS
	5	4	SS	4	SS
	6	3	S	4	S
	7	3	S	4	SS
	8	3	S	4	SS
	9	4	SS	4	SS
Readability	10	3	S	4	SS
	11	3	S	4	SS
Ease of use	12	3	S	3	S
	13	1	TS	1	TS
Tests	14	3	S	4	SS
	15	3	S	4	SS
Total		45		54	
Average		3,00		3,60	
Score Percentage		75	B	90	SB

From the validity results, the prototype from the media aspect is valid. This proves that prototype from the media aspect is appropriate to use. Furthermore, the validity testing of material aspects can be seen in the following Table 2.

From the table above it can be seen that the prototype from the material aspect is valid. This proves that a prototype from a material aspect is feasible to use. Furthermore, the validity testing of language aspects can be seen in the following Table 3.

TABLE II. VALIDITY TEST RESULTS (BEGINNING AND END) MATERIAL ASPECTS

Variable Criteria	Indicator	Initial Score	Desc.	Final Score	Desc.
Content and learning objectives	1	3	S	4	SS
	2	3	S	4	SS
	3	3	S	3	S
	4	3	S	4	SS
	5	3	S	4	SS
Presentation of material	6	4	SS	4	SS
	7	3	S	4	SS
	8	3	S	3	S
	9	3	S	4	SS
Instructional	10	4	SS	4	SS
	11	4	SS	4	SS
	12	3	S	4	SS
Test	13	1	STS	3	S
	14	3	S	4	SS
	15	3	S	4	SS
	16	3	S	4	SS
Total		49		61	
Average		3,06		3,81	
Score Percentage		77	B	95	SB

TABLE III. VALIDITY TEST RESULTS (BEGINNING AND END) LANGUAGE ASPECTS

Variable Criteria	Indicator	Initial Score	Desc.	Final Score	Desc.
Grammar	1	2	TS	4	SS
	2	2	TS	3	S
	3	2	TS	3	S
Communicative	4	4	SS	4	SS
	5	4	SS	4	SS
Suitability for student development	6	3	SS	3	S
	7	3	SS	4	SS
Compliance with social studies learning steps	8	3	SS	4	SS
	9	3	S	3	S
	10	3	S	3	S
	11	2	KS	3	S
Total		31		38	
Average		2,82		3,45	
Score Percentage		70	B	86	SB

From the table above it can be seen that the prototype from the language aspect is valid. This proves that the prototype from the language aspect is appropriate to use. Overall, it can be concluded that the experts stated the prototype is valid both in terms of media, material, and language. Experts have an important role in the validity process [22] [23]. Experts can test the feasibility of prototyping from the scientific discipline they have. When experts state that a prototype can be used.

• **Practicality Test**

Practicality test aims to test the practicality of the prototype [24] [25]. The data of Android-based educational game testing is in the form of primary data directly obtained from teachers and students using an assessment instrument in the questionnaire. Practicality test variables by teacher and students are ease of use, benefits, appearance and time. The practicality test of a teacher is by giving 15 questions. The result is almost all questions get a percentage of 100%. Whereas in questions number 3, 5, 12 and 14, teachers get a percentage of 75%. After the researchers examined the respondent's data, it was found that the 25% difference was obtained from a grade 5 teachers at Al Azhar elementary school. In question number 3, this respondent answered no because the respondent was not in the research room when the researcher displayed instructions for using PowerPoint application. Whereas for questions number 5, 12, and 14, respondents answered no because this application is intended for students of 4th grade with K13 latest revision. Thus, student and teachers experience obstacles in understanding the process of learning, time allocation, and materials and tests in this application. It can be concluded that the learning media developed are very practical.

The next test is a practicality test of students. For practicality testing, 15 questions were given, the result was 87.35% of students stated very practical, the rest stated practical. This happens because, in the questions related to the allocation of time, many students state that the time given is less. However, we can still conclude that the learning media developed are very practical. From practicality test results, it can be determined that the media developed are practical in terms of teacher and students.

• **Effectiveness Test**

Data on Android-based educational game effectiveness test was obtained from student learning outcomes.

Learning outcomes are assessed in all three domains of learning, namely cognitive (knowledge), affective (attitude) and psychomotor (skills). Following is an explanation of effectiveness test results in each social studies learning domains using Android-based educational games:

• **Cognitive (knowledge)**

Cognitive domain assessment is obtained from the evaluation test carried out directly at the end of learning. The evaluation test is made using Google Form by filling out online. The cognitive domain learning outcomes are in the very good category (SB) with a 90% percentage of learning outcomes completeness. With details on the acquisition of grades and predicates, namely: the value of theme 7 with an average of 91 being in the predicate of good (B) and social studies subjects with an average of 93 being in the predicate of very good (A). This proves that the learning media developed has a good impact on students' cognitive abilities. Learning media can present tangible and clear objects to students to facilitate students in understanding information [26].

• **Affective (attitude)**

Affective assessment is carried out when learning activities take place using observation sheets filled in by the class teacher. According to the 2013 curriculum assessment guide on attitude assessment, there are six aspects assessed in this affective domain, namely: honest, discipline, responsible, polite, caring, and confident [27].

The results are as follows 1) in being honestly; 17 students are very good, 4 students are good, and 1 student still needs guidance. 2) In being discipline; 14 students are very good, 6 students are good, and 2 students are disciplined enough. 3) In being responsible; 7 students are very good, 14 students are good, and 1 student still needs guidance. 4) In being polite; 10 students are very good, 9 students are good, 2 students are good enough, and 1 student needs guidance. 5) In caring behavior; 6 students are very good, 10 students are good, 4 students are good enough, and 2 students need guidance. 6) In being confident 11 students are very good, 10 students are good, 1 student is confident enough. This proves that learning media can influence students' affective abilities. Learning media can make students active in the learning process [28].

• **Psychomotor (skills)**

Psychomotor domain assessment is carried out when learning activities take place using observation sheets filled in by class teachers. The aspects assessed are aspects of activeness, discussions, and using media. The results are as follows; in activeness, 11 students are very active, 4 students are active, 4 students are quite active, and 3 students are less active. In the discussion, 14 students are highly skilled, 4 students are skilled, 3 students are quite skilled, and 1 student is less skilled. In using media, 11 students are highly skilled, 9 students are skilled, 1 student is skilled enough, and 1 student is less skilled.

Based on the results of using Android-based educational games of elementary school students, it

can be concluded that Android-based educational games are valid, practical, and effective therefore they can be continued at the next stage, namely disseminate.

D. Disseminate Phase

Disseminate phase is a stage of spreading out the results of prototype development [29]. Disseminate phase is carried out according to the date stated on March 29. Researchers carried out suggestion and input from both contributors to research all elementary schools implementing digital classes in Bukittinggi city. From 10 elementary schools that have digital class projects, researchers finally proposed 6 elementary schools to be observed. However, from 6 elementary schools, only 2 of them could carry out their research, namely: Elementary school 01 Benteng Pasar Atas and Al Azhar Elementary school. Whereas the other three cannot be implemented for different reasons, namely Elementary school 03 Pakan Kurai and Elementary school 04 Birugo are making recoveries to the digital classroom learning space. While Elementary school 07 is doing Final national exam.

Based on the results, it is seen that the process of developing an Android-based educational game is suitable for the 4D model. The 4D model has several advantages, namely: detailed development procedures/steps, appropriate to be used as a basis for instructional media development, a detailed and systematic description, and involves expert judgment. Therefore, these advantages can produce learning media that are valid, practical, and efficient as expected by researchers. Of course, these three things are determined by the results of the study.

A result of Android-based educational game research that has been developed for social studies subjects in 4th-grade elementary school is very good. This can be seen through:

- Validity test results by experts as validators consist of media, material, and language aspects in a very good category.
- Product practicality test results where teacher's and student's assessment of educational game has been developed are also very good.
- Product effectiveness test results can be seen from student learning outcomes in all three areas, namely: cognitive, affective, and psychomotor. They are in good and very good categories.

The results of this study have shown the use of educational media based on Android learning games has a positive impact on social studies learning in elementary schools. In teaching and learning process, it has provided many benefits, namely: efficient in delivering material, effective in learning outcomes, and increase students' interest and motivation to learn about the beauty of diversity in Indonesia.

The results of previous studies also revealed the positive impact of using Android-based educational game learning media. Mahardani & Rachmadyanti's research that developed Android-based GENTARA media for social studies learning for 5th-grade elementary school students is very effective and can be used in the learning process, especially the material about Colonial Period of West Nation in Indonesia [30]. Student learning outcomes indicate that they have exceeded the Minimum Master

Criterion with an average of 91, and student learning completeness reaches 100% with high qualification. Although both are developing android-based learning media for social studies learning in elementary schools, the steps in development are slightly different. This GENTARA media was developed using a 4D model modified by Trianto into 3P, namely: defining stage, design stage, and development stage. While the disseminated stage was not carried out because it requires a long process and time.

Android-based learning media has indeed been widely developed, it's just still in the form of the separate subject matter. Most of these developments are aimed at secondary or vocational schools, while most subjects are mathematics, science, and languages. Of course, the development of this research is very different from before because it contains thematic learning in it. Android-based learning media development is still very few using 4D methods as researchers do in this research. Most android-based learning media development uses waterfall, ADDIE, or Borg & Gall models. Researchers argue that this 4D model is the most appropriate model for developing android-based learning media because the phases are concise but detailed. In each phase, there are steps that strengthen the learning media produced. Surely this has its own advantages for the 4D model. Hopefully, there will be a lot of development of Android-based learning media for thematic learning by using a 4D model in the future, therefore, it can be a comparison of the research development that researchers conducted in this research.

IV. CONCLUSION

Based on research conducted educational media learning games based on android in social studies learning using AppsGeysers applications are valid, practical and effective to use for elementary school students.

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