Development of Interactive Learning Media based on Android Education Geography

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Abstract. This research is a type of product development that aims to determine the feasibility of developing interactive learning media products based on Android. The research method used is the design of the development model used in this study is the adaptation of the Luther model. The results of this study are: (1) Android-based interactive learning media applications on national cultural material and global interactions are arranged by getting input from validators (2) the results of the feasibility of the percentage of android-based interactive learning media by media experts are seen based on the aspects of animation, video aspects, video aspects, packaging aspects, packaging aspects, packaging aspects and aspects of use.

Keywords: Development, Interactive Learning, Media Based on Android

1. Introduction

Technology is now very rapidly developing, especially mobile technology, one of which is hardware such as mobile phones. Mobile is one of the hardware devices that the majority of people have and use in daily life as a communication tool. At present, the majority of people use mobile phones, especially many mobile phones that are technologically advanced or often referred to as smartphones, one of which is an Android cellphone.

In general, it can be interpreted that interactive media is a delivery media system that presents video recording material with computer control to viewers (students) who not only hear and see video and sound, but also provides an active response and that response determines speed and presentation sequences [1].

Arisandi [2] states that media that combines two or more elements consisting of text, graphics, images, photos, audio, and animations that consist of two categories, namely: (1) linear multimedia that is not equipped with any control device that can be operated by students and operated systematically, such as television and film, (2) interactive multimedia technology equipped with controllers that can be operated by students by choosing what is desired for the next process such as games applications.

In 2000 Google acquired a company called Android which was founded by Andy Rubin, Rich Miner and Chris White. Then on November 5, 2007, Google introduced Android. To support the development of Android, Google collaborates with several companies such as HTC, Intel, Motorola, Qualcomm, T-mobile, Nvidia and Asus to form the Open Handset Alliance (OHA) [3].
1.1 Strengths and Weaknesses of Android-Based Learning Media

Irawan [4] states that there are several advantages of android-based learning media that are not owned by other media. The advantages and disadvantages of Android-based learning media are:

The advantages of Android-based learning media (mobile learning):

- Can be used anywhere at any time. In line with the educational revolution theory needed now, that is learning that can be done anytime and anywhere.
- Mostly mobile device have a price that is relatively cheaper than the price of a desktop pc.
- The size of the device is small and light compared to the desktop PC
- It is estimated that more learners can be included because m-Learning utilizes technology commonly used in everyday life.

Disadvantages of mobile learning media:

Mobile learning is a potential alternative to expand access to education. However, there is not much information regarding the use of mobile / smartphone, especially cellular phones, as a learning media. This is unfortunate because the level of ownership and level of usage that is already quite high is not used to be directed towards education.

1.2 Steps for Interactive Media Development

According to Sutopo [5] states that the procedure of Luther's development model which has been refined by Sutopo has six stages, but it must be done sequentially. The six stages:

a. Concept

The concept is the stage to determine the purpose and who is the program user (audience identification). The purpose and program users influence the display of multimedia that will be produced so that information can be conveyed to the User. User characteristics and abilities also influence design creation. In addition, this stage will also determine the types of applications such as presentations, tutorials, etc., and determine application objectives such as entertainment, training, learning, and so on. The results of this stage are in the form of documents or notes to reveal the product objectives to be achieved.

b. Design

Design or design is the stage of making specifications regarding program architecture, style, appearance, and material or material requirements for the program. Product specifications are as detailed as possible by creating a storyboard to describe the description of each scene, by listing all multimedia objects and links to other scenes and flow charts to describe the flow from one scene to another.

c. Material Collecting

Material collecting is the stage of collecting materials that are in accordance with their needs. These materials such as clip art images, photos, videos, animations, audio, etc., as long as the materials collected are in accordance with the design.

d. Assembly

Assembly is the stage of making all multimedia objects or materials. Application creation is based on the design stage, such as storyboards, flow charts, and or navigation structures.

e. Testing

Testing is done after completing the manufacturing phase by running the application / program and seeing whether there is an error or not. The testing phase is divided into two, namely alpha stage and beta stage. Alpha stage is done by the maker or the creator's own environment, whether the results are as desired by the maker or not. At this stage the developer added, alpha testing was also carried out by material experts and media experts. After passing the alpha stage testing, the beta stage is done by involving application / program users, namely lecturers and students. From the results of the trial,
improvements were made in accordance with input from lecturers and students. Then another trial is conducted to improve application performance so that it meets student learning needs.

f. Distribution
At this stage, the application is stored in a storage media. If the storage media is not enough to hold the application, compression on the application can be done. Lack of children's understanding of the material about learning about National Culture in Indonesia, therefore the author utilizes interactive learning applications about the distribution of cultural diversity based as a means to facilitate learning. This application can make it easier for children to learn about National Culture in Indonesia that is more easily understood by using an Android-based mobile phone or mobile learning, and children can interact with objects such as National Culture in Indonesia. In addition to this interesting and educative application, it is hoped that it will increase the child's desire to learn about the lessons.

The author utilizes an Android-based National Cultural Diversity Learning application using a smartphone (mobile learning). The use of smartphones is intended for the community, especially students to better understand the material about the Distribution of National Cultural Diversity. This media contains the diversity of National Culture which includes Aceh culture, Batak, West Sumatra, Balinese Culture, Bugis-Makassar Culture, Sundanese Culture (West Java), Javanese culture which is presented in an attractive graphic so that it becomes an interactive learning media.

The use of media can help and simplify complex concepts so that students can understand the material easily and because of the availability of media (supply) that are still needed for school, due to the use of Android-based media according to [4] Android-based learning media can be used anywhere at any time. In line with the education revolution theory that is needed today, namely learning that can be done anytime and anywhere, because m-Learning utilizes technology that is commonly used in everyday life. It is hoped that this learning media can create a learning process for teachers and students to answer problems that are difficult to understand when students are still many who are confused in the method explanation by the teacher and the teacher can explain with this Android-based interactive learning media.

2. Research Method
This research is a type of product development that aims to find out the feasibility and effectiveness of the product. The development design using the development model used in the research is an adaptation of Luther's model [6], consisting of six stages of activity, namely: Concept, Design, Collecting Materials, Assembly (manufacture / production), Test Drive (trial) and Distribution (distribution).

The steps for developing interactive media refer to Luther's development method which has six stages including: 1). Concept, 2). Design, 3). Collecting Material, 4). Assembly, 5). Testing, 6) Distribution.

3. Results and Discussion
Android-based interactive media in this study utilizes media through Android-based mobile phones designed using the Unity 3D + Monodevelop Application program and the content uses Adobe Illustrator, Adobe Photoshop, Adobe After Effects and Adobe Audition by my colleague Azis Maulana Ihsan. The learning media in this study are equipped with videos, games and problem exercises.
3.1 Steps to Developing Interactive Media Based on Android

The steps for developing interactive media refer to Luther's development method which has six stages including: 1). Concept, 2). Design, 3). Collecting Material, 4). Assembly, 5). Testing, 6) Distribution.

3.1.1 Concept

The concept of media development refers to the media used by geography teachers that were previously used in classroom learning. The researcher knows in advance the conditions of geography learning by asking through the geography teacher to find out whether the use of interactive media can run in schools by students, whether students can use mobile phones as learning media. Selection of material, researchers ask and share directly with geography subject teachers. The material in interactive learning media is National Culture and Global Interaction. The constraints in this material are that teachers are very limited in introducing cultures in Indonesia without media for students to understand cultures in Indonesia. Students find it difficult to identify cultural distributions in Indonesia. Therefore, in this media the material is focused on "National Culture and Cultural Interaction"

The purpose of making Android-based interactive media is so that the use of the application can be accessed by all students wherever and whenever, whether at school or outside of school, students can access it, understand it or learn it flexibly by getting to know Indonesian cultures.

3.1.2 Design

Interactive media design is done using various software such as: Unity 3D + Monodevelop application and its content using Adobe Illustrator, Adobe Photoshop, Adobe After Effects and Adobe Audition. This interactive media starts from the emergence of ideas from material on National Cultural Interaction and Global Interaction. In this interactive media, it starts with watching videos of material on National Culture and Global Interaction, playing cultural games, looking for traditional tools for cultures in Indonesia, and finally answering questions.

Components contained in this interactive media consist of image, text, animation, audio, video, navigation. The following is a description of the various components.

Layout Color

For the basic color in the opening appearance, it is dominated by light blue. The initial appearance of this interactive media featuring traditional musical instruments, namely angklung, is a traditional instrument from West Java which is a characteristic of Indonesian culture.

Text
To select text in this media, use the Calibri writing font. For font selection in the question package use the Calibri writing font. This calibri writing font is selected so that all Android-based interactive media users can read clearly.

**Image**
Images in android-based interactive media use Adobe Illustrator software and some are adopted from the internet. For the main image display on the home page adopt from the internet. For images on video using Adobe Illustrator to adopt on the internet partially.

**Audio**
Audio / sound used is the sound of the media maker by being converted into animated sound using the Adobe Audition application.

**Video**
Video in this android-based interactive media has a duration of 4 minutes 18 seconds. Video in this Android-based interactive learning media has only a portion of the screen, but has a navigation button to watch Android-based interactive learning videos in full screen or full screen. Making this video using software.

**Navigation**
In this android-based interactive learning media using navigation that uses 3D unity applications, where the use of applications on this media is using the 3D unity application. In this media, users are required to press the buttons contained in it, such as the start button to play this cultural application, play video button, play game button, exercise button, button to answer questions, information button.

**Packaging**
The final result of making interactive media is based on Android where the end result of this application is in coding with the Monodevelop application programming language, so users can easily use this interactive media application on an Android-based handphone.

### 3.1.3 Collecting Material
Materials needed in making interactive media based on Android are in the form of photos, videos, audio. The assets are made by assets, in making the display design of the application using Adobe Illustrator, the animation is made with the application Adobe Illustrator, Adobe After Effects, Adobe Audition.

### 3.1.4 Assembly
For making an application it takes 3 weeks. This process is done when it's finished collecting and making materials such as sound / audio, animation, pictures, story board, flowchart. For assets in this application, it is processed in unity 3D applications, and programming languages are made using monodevelop, to compile and make coding so that from the UI (user interface) design can be an application. Applications made later in Build use a 3D unity application so that it becomes an application with an extension. Apk. ready to use.

The first is to make the design of images displayed in an interactive media based on Android such as the background in the opening screen. At this stage, the software used is Adobe Illustrator. The first image created is a background from an interactive media display based on Android.

![Figure 2. Steps to Making Main Display Background.](image-url)
In the background there is a picture of angklung that depicts traditional musical instruments in West Java. The image is made with Adobe Illustrator.

![Image of angklung]

**Figure 3.** Steps for Making a Media Icon.

Then it is combined into one main menu display in the opening display on Android-based interactive learning media. The following is the opening display of the main menu, the interactive Android-based learning. In the main menu display picture which is a picture display of angklung where learning is currently the researcher will go to the field in high school in West Java and make navigation the main menu display.

![Main menu display with angklung image]

**Figure 4.** Steps for Making a Main Display Menu

The next step is making a home navigation, player, question package, and information and understanding from national culture in a simple way that is made using the unity 3D application.

![Navigation keys and icons]

**Figure 5.** Steps for Making Navigation Keys
Display on the main menu is also made animated videos made using Adobe Illustrator, Adobe Preimer software and for the sound in the video changed with animation or cartoon effects.

Figure 6. Steps to Making Videos.
For the next step of making games using Adobe Illustrator software, and Adobe After Effect.

Figure 7. Steps to Making a Game.
For Making practice questions, the software used is from the 3D unity application.

Figure 8. Steps to Making a Question Package.

The final step in making the information used is the 3D unity software.
5) Product Testing
The testing phase of this product is an tester of interactive media trials that will be carried out in several stages. The stages of this trial include testing to media experts, testing to material experts, testing to teachers and testing to students. Trials to media experts and material experts were carried out to see the feasibility of android-based interactive media, then trials to teachers and students were conducted to obtain results regarding the feasibility of the media.

6) Distribution
Distribution is an activity to spread interactive media products based on Android. Distribution is carried out after media products have been completed in a series of trials both from the aspect of feasibility. Interactive media that has become a product in the form of an application with extension.apk then disseminated applications to students.

### Results of Feasibility of Interactive Learning Media Based on Android by Media Experts.

**Table 1. Data on Validation Results by Media Experts**

| Aspect   | Percentage |
|----------|------------|
| Text     | 80%        |
| Image    | 80%        |
| Animation| 80%        |
| Video    | 80%        |
| Packaging| 80%        |
| Use      | 80%        |

Based on Table 1, the results of the feasibility of the percentage of android-based interactive learning media by material experts that get a percentage: 80% text aspect, 80% image aspect, 80% animation aspect, 80% video aspect, 80% packaging aspect, 80% usage aspect.

### 4. Conclusion and Recommendations

Based on research on the development of instructional media that has been done, it can be obtained the results of this development research that has produced an Android-based interactive learning media for high school class XI students using the Luther model. The stages passed are 1). Concept, 2). Design, 3). Material Collecting, 4). Assembly, 5). Testing, 6) Distribution. To the geography teacher, learning should be used in the classroom to use media as a tool to support student learning because it is very helpful.

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