Effectiveness of Android-Based Learning Media in Digital Simulation Subjects

Renny Permata Saputri, Monica Fransisca
renny_permata@upiyptk.ac.id, monicafransisca@upiyptk.ac.id
Universitas Putra Indonesia "YPTK" Padang

Abstract
The increasingly rapid digital development demands that the learning media used can attract students' interest and attention. The research method used is Research and Development with 4D development stages (Define, Design, Develop, Disseminate). The aim of this research is to determine the effectiveness of Android-based learning media in digital simulation subjects at Padang City Vocational Schools. The research population was 73 Padang City Vocational High School students who were randomly selected from SMKN 1 Padang, SMKN 2 Padang, and SMKN 4 Padang. Based on data from the effectiveness test results, the average effectiveness was 84.96%. So it can be concluded that the use of Android-based learning media in digital simulation subjects at the Padang City Vocational High School is categorized as an effective media.

Keywords
Android, Effectiveness, Digital Simulation, Learning Media
A. Introduction

Advances in science and technology make everything easier and faster with the help of technology. Advances in science and technology provide challenges for educators, especially teachers to create computer-based learning media [1]. Through the current digitalization process, learning media are no longer traditional or passive, and many learning media utilize information technology [2]. So far, learning media has only been limited to traditional learning media such as explanations of material on the blackboard, demo materials, pictures and printed copies of modules. These media can now be converted into visual formats through the use of information technology. Current technological developments can also be accessed more easily, namely by using a smartphone [3]. Using a smartphone can really help everyone, from making work easier to learning media and communication tools. This will change the lifestyle of everyone who uses a smartphone, increasing comfort in everyday life, including the learning process [4].

Based on observations of digital simulation subjects, we found that most learning media are still traditional, with minimal use of technology. Therefore, media is needed that can arouse students' interest and attention. Using Android is easy to adopt because most teachers and students already use it. The use of Android-based learning media has been used in certain subjects [5]. Using Android as a learning medium is one means of supporting learning [6]. It is hoped that this Android-based learning media can save time on learning materials and enable students to utilize the remaining study time for active and creative independent learning activities [7].

Digital simulation subjects are similar to material in certain skills programs, so teachers do not need to repeat material in class. However, students can read the material as needed. Therefore, it is necessary to have interesting learning media that can stimulate students’ desire and motivation to learn [8]. Android greatly simplifies everyone's tasks, including visualizing interesting content and using it in learning media [9].

The aim of this research is to determine the effectiveness of Android-based learning media for digital simulation subjects in vocational high schools in Padang City.

B. Research Method

The development of Android-based learning media for digital simulation subjects at the Padang City Vocational High School is included in the research and development scheme. This research and development method is a research method used to produce certain products and test the product's effectiveness. Products do not always take the form of objects or hardware and other learning tools. However, it can also be in the form of software [10].

The ten steps in the research and development method are shown in the chart in Figure 1[10].
Based on the research and development method, a development procedure was used, namely 4D models which consists of four development stages, consisting of define, design, develop and disseminate, these stages were developed by Thiagarajan, Semmel [11] which is shown in Figure 2.

Figure 1. Procedure of Research and Development (R&D) Method

![Diagram of 4D models showing Define, Design, Develop, and Disseminate stages]

Figure 2. Research Procedure
The define stage includes several main steps, namely student character analysis (learner analysis), content/concept analysis (concept analysis) and formulating learning objectives (specifying instructional objectives). Thiagarajan divides the design stage into four activities, namely: constructing criterion-referenced test, media selection, format selection, initial design. At the develop stage, effectiveness tests were carried out with users, namely Padang City Vocational School students. The disseminate stage is the stage of spreading the use of devices that have been developed in a wider scope. The development of Android-based learning media that has been tested for effectiveness will be reproduced and is suitable for distribution.

C. Result and Discussion

Effectiveness trials are useful for seeing the level of effectiveness of digital-based digital simulation learning media. The effectiveness test was carried out with 73 Padang City vocational high school students who were randomly selected from SMKN 1 Padang, SMKN 2 Padang, and SMKN 4 Padang. The assessment is carried out using several indicators, namely the enjoyment of learning indicator which contains five statements and the presence of interesting teaching materials in the learning media which also consists of five statements.

Data from tests on the effectiveness of using learning media were analyzed using formulas modified from [12] below:

\[ NP = \frac{R}{SM} \times 100 \]

**Information:**

- NP = The percentage value sought or expected.
- R = Raw score obtained by the validator.
- SM = Ideal Maximum Score from the test in question.
- 100 = Fixed Number.

After the percentage is obtained, grouping is carried out according to the following criteria stated in [12]:

**Table. Effectiveness Assessment**

<table>
<thead>
<tr>
<th>No</th>
<th>Value</th>
<th>Rated aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>86% - 100%</td>
<td>Highly Effective</td>
</tr>
<tr>
<td>2</td>
<td>76% - 85%</td>
<td>Effective</td>
</tr>
<tr>
<td>3</td>
<td>60% - 75%</td>
<td>Fairly Effective</td>
</tr>
<tr>
<td>4</td>
<td>55% - 59%</td>
<td>Less Effective</td>
</tr>
<tr>
<td>5</td>
<td>&lt;= 54%</td>
<td>Very Less Effective</td>
</tr>
</tbody>
</table>

**Source:** [12]

The results of the effectiveness test contain questionnaire filling data which is processed using Microsoft Excel software. Data is obtained from processing the numbers obtained when filling out the questionnaire and then calculating the total weight, average value and criteria. Data on effectiveness test results can be seen in the following Figure.
The results of the effectiveness test are then processed in the form of a frequency distribution figure based on the statement items in the questionnaire, namely 10 statement items. The frequency distribution results can be seen in the following table.

### Table 11. Frequency Distribution of Effectiveness Test Results

<table>
<thead>
<tr>
<th>Interval Class</th>
<th>F₀</th>
<th>%F₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>81-83</td>
<td>7</td>
<td>46.67%</td>
</tr>
<tr>
<td>84-86</td>
<td>2</td>
<td>13.33%</td>
</tr>
<tr>
<td>87-89</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>90-92</td>
<td>1</td>
<td>6.67%</td>
</tr>
</tbody>
</table>

Next, the results of the frequency distribution of the statements are made into a frequency distribution histogram so that it is clearer and easier to see the percentage of the questionnaire results.
Based on data from effectiveness tests on 73 Padang City vocational high school students, the average effectiveness percentage was 84.96% and was classified as effective for use as Android-based learning media for digital simulation subjects.

D. Conclusion

The application of Android learning media in the Digital Simulation subject in this study was categorized as effective and suitable for use for Padang City Vocational School students with an average percentage of effectiveness test results of 84.96%

E. Acknowledgment

The researcher would like to thank Putra Indonesia University YPTK Padang for providing permission for the research that has been carried out. Apart from that, the school has given permission to carry out research at the school concerned, along with a team of field surveyors.

F. References


