

Design and Creation of Android-Based Learning Media in Informatics Subjects in Vocational High Schools

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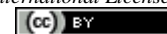
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Abstract

This research aims to determine the Validity, Practicality and Effectiveness of Designing and Making Android-Based Learning Media in Class X Informatics Subjects at SMK N 9 Padang for the 2022/2023 Academic Year. This research uses the development research method (Research & Development). The sample in this study consisted of 35 vocational school students. This research method uses analysis (ADDIE), with the design and development steps as follows. (1) Analyze, (2) Design, (3) development, (4) Implement, and (5) Evaluate. The results of the validity test by experts, the overall validator test assessment of Android-based learning media in the Class X Informatics subject at SMK Negeri 9 Padang was 87.11%, so the validity level can be interpreted as valid for use. The results of the overall practicality test assessment of the Android-based Learning Media in the Informatics subject Class The results of the overall effectiveness test assessment of the effectiveness of Android-based learning media in the Informatics subject Class In conclusion, based on assessments along with expert input and the results of field trials, Android-based learning media as a learning medium has been tested for its suitability, superiority and can be used in the learning process in class X Informatics subjects at SMK Negeri 9 Padang.

Keywords: android, learning media, informatics, vocational high school, ADDIE.

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1. Introduction

Education is one of the efforts made by humans to learn and develop skills which is carried out at school and on campus [1], [2]. All human beings have the right to quality education. Every country tries to provide quality education that can be accepted by all its citizens [3]. Quality education will produce knowledgeable human resources with good personalities [4], [5]. Through education, humans will learn knowledge and knowledge from teachers and the learning environment. In learning activities the teacher interacts with students using learning resources [6], [7]. Teachers in the learning process are involved in various activities such as formulating, explaining, and drawing conclusions from various theories and knowledge being studied. Learning activities are the most basic activities in the entire educational process [6], [8]. This means that educational achievement depends a lot on how the teaching and learning process is designed and carried out professionally [9]. At this time, learning with the help of technological devices such as laptops/computers with the help of an internet network really helps teachers and students in the learning process activities [10]. Some examples of the use of technology in learning such as the use of PowerPoint for presentations [11], [12], [13], e-learning [14], Android-based learning media, etc. Learning media are tools or objects used by teachers to

facilitate communication and interaction between teachers and students to achieve the desired learning goals [15], [16]. The use of learning media is expected to improve student learning outcomes at school [17], [18], [19].

Based on interviews conducted by researchers on Wednesday 19 October 2022 with informatics subject teachers at SMK Negeri 9 Padang, in general, students at SMK Negeri 9 Padang already have smartphones with the Android operating system. The Android operating system has several advantages compared to other operating systems, namely this system provides free storage space from a Google account, several applications in this operating system can be run simultaneously, the Android operating system can be run on various devices such as watches, tablets, TVs, etc. PC and Mobile [20], [21]. The Android operating system is the most widely used operating system currently for mobile phone devices [22], [23]. Android smartphones are used by students for communication, information and entertainment purposes in everyday life [24], [25], [26].

An important learning problem nowadays is changing the curriculum to an independent curriculum which is the result of a revision of the previous curriculum, namely the 2013 curriculum. In implementing the independent curriculum, teachers and students are required to use technology in their learning activities.

It is hoped that the use of this technology can help teachers in learning activities. Meanwhile, for students, the use of technology in learning activities can increase student interest and learning outcomes. This curriculum change resulted in a lack of student learning resources at school. This results in limited learning resources in schools, for example a lack of supporting books and learning media that are in accordance with the independent curriculum [27]. Supporting books in schools have an influence in improving student learning outcomes. Based on observations made by researchers at SMK Negeri 9 Padang, not all students can have an informatics guidebook as a learning resource, because of the limited number of books available in the school. Apart from limited learning resources at school, students also experience problems when they want to buy learning guidebooks. This is caused by students' lack of economic ability to purchase learning guidebooks.

Based on this explanation, problems arise that need to be studied related to the application of computer-assisted learning media to improve student learning outcomes. The aim of this research is firstly to produce an Android-based learning media application in the Informatics subject class Class X Informatics at SMK Negeri 9 Padang for the 2022/2023 academic year.

2. Research Method

2.1. Types of Research

This type of research uses design and development or what is usually called R&D (Research and Development). The development model in this research uses the Analysis, Design, Development, Implementation, Evaluation (ADDIE) model [28].

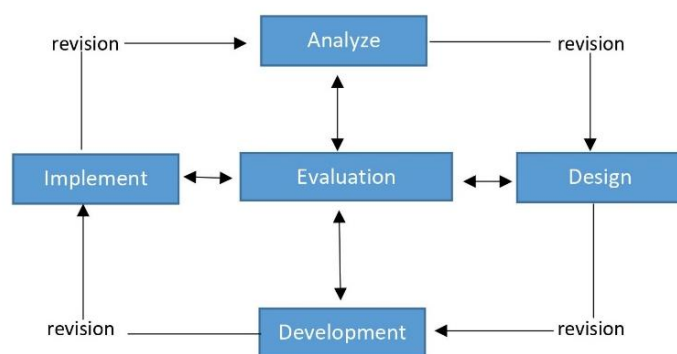


Figure 1. ADDIE Development Model

This research and development method a research method used to produce products and test the effectiveness of these products. These products do not always take the form of objects or hardware, such as books, stationery and other learning tools. However, it can also be in the form of software.

2.2. Data Analysis Technique

Analysis of this research data was carried out using descriptive analysis. Analysis includes analysis of the validity of Android-based learning media, analysis of the practicality of Android-based learning media and analysis of the effectiveness of Android-based learning media with:

- Provide an answer score with criteria based on a Likert scale, namely:

Firstly, it provides validity and practicality answer scores using a Likert scale consisting of 5 alternative answers.

Table 1. Assessment of Validity and Practicality

Choice	Description	Weight
SS	Strongly agree	5
S	Agree	4
KS	Disagree	3
TS	Don't agree	2
STS	Strongly Disagree	1

- Determine the highest score using the formula
Highest score = number of respondents * number of question items * maximum score. The next step is to determine the highest score from all validator answers in the Android-based learning media validity test.
- Determine the total score for each respondent by adding up all the scores obtained from each indicator. At this stage, the total score of each validator is determined.
- Determine the score obtained by adding up the scores from each validator. After determining the total score from each validator, then determine the score obtained by each validator.
- Determining the value of validity, practicality and effectiveness using the following formula:

At the final stage in the validity, practicality and effectiveness test, the validity, practicality and effectiveness values are determined, namely the percentage sought or expected.

$$NP = \frac{R}{SM} \times 100 = \quad (1)$$

Information :

NP = the percent value sought or expected,

R = the raw score obtained by the respondent,

SM = the ideal maximum score from the test in question, and 100 is a fixed number.

- Providing a validity assessment using the following modified criteria [28].

Table 2. Classification of Assessment Aspects

Percentage of Total Value	Description
100% - 90%	Very Valid
89% - 80%	Valid
79% - 65%	Quite Valid
64% - 55%	Less Valid
< 55	Not Valid

- g. Then determine the validity frequency distribution value modified from Prof. Dr. H. Agus I. Irianto as follows:

$$R = \text{Highest data} - \text{Lowest data} (2)$$

$$K = 1 + 3.3 \log n (3)$$

Information :

K = the number of classes, and

R = the range distance.

3. Result and Discussion

3.1. Design Results

On the page after the intro, students will go to the main page, where several menu buttons are available. These menus will be used by students to support the learning process. The menu page contains menu buttons such as the KI/KD menu, material from the Informatics subject, learning videos, evaluations in the form of practice questions, a profile containing profiles of learning media creators and the about menu to view information from learning media.



Figure 2. Menu Page

In the evaluation there are questions consisting of five answer points that students can answer regarding general knowledge about simulation lessons and digital communication. Students can answer the questions directly and get a score. The image below is the initial

display on the evaluation menu where students have to input their names. and click the start button to enter the evaluation questions.



Figure 3. Evaluation Menu

3.2. Analysis Results

Based on research results from Android-based simulation and digital communication media products for class X at SMK Negeri 9 Padang. Designing and Making Android-Based Learning Media for Simulation and Digital Communication Subjects for the Class of SMK Negeri 9 Padang for the 2022/2023 Academic Year is very valid to use because research tests have been carried out by 3 validators with the average result in the validator testing being 87.11%, compared with relevant research by researchers, which is 82.00% so the level of validity is said to be valid [29], therefore the research that the researchers conducted has the same level of validity.

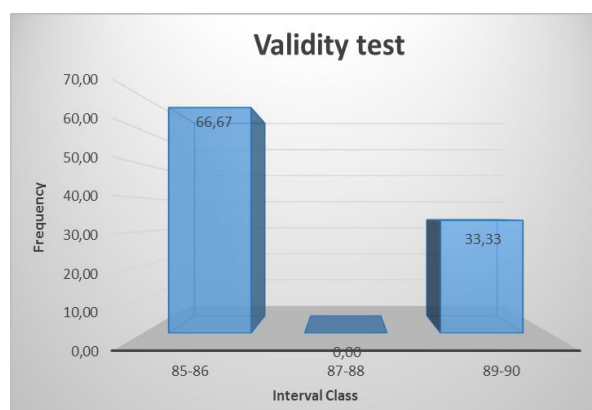


Figure 4. Validity Questionnaire Histogram

Regarding practicality in using this Android-based learning media application, it is said to be very practical for use by class 88% so the level of practicality is said to be very practical, therefore the research carried out by relevant researchers is the same level of practicality.

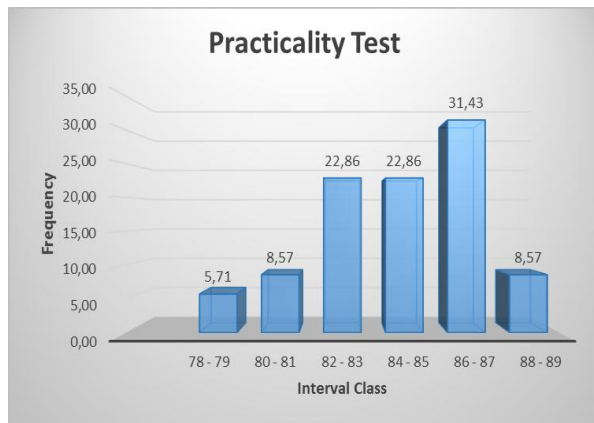


Figure 5. Practicality Questionnaire Histogram

In terms of conditions of use, the effectiveness of learning time and the benefits of conducting research tests on class students at SMK Negeri 9 Padang with an average result of 91.36% is very effective/good for students at SMK Negeri 9 Padang, compared to research as relevant research, the level of effectiveness was 87.42% so the level of practicality was said to be very effective in use [30]. Therefore, the research carried out by relevant researchers has the same level of effectiveness.

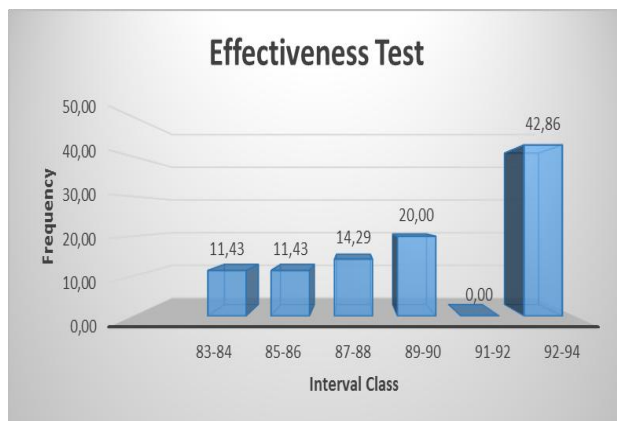


Figure 6. Histogram of Effectiveness Test Questions

4. Conclusion

Based on the description, data analysis and development of Android-based learning media, it can be concluded that the validity through the validator test assessment of Android-based learning media is 87.11%, so that the level of validity can be interpreted as very valid for use in class X informatics subjects at SMK Negeri 9 Padang. The practicality of Android-based learning media is 93.71%, so the level of practicality can be interpreted as very practical for use in class X digital simulation and communication subjects at SMK Negeri 9 Padang. The effectiveness of Android-based learning media is 91.36%, so the level of effectiveness can be interpreted as very good for use

in class X digital simulation and communication subjects at SMK Negeri 9 Padang.

For further research, it is hoped that learning tools will create a more structured design. Prepare a design plan for creating Android-based learning media. This is done with the aim of producing learning media that is neat and in accordance with the needs of the latest curriculum. Then from this research the author hopes for further research to conduct research in other places such as high schools or middle schools

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