The Development of Android-Based Learning Media for Basic Accounting Subjects for Class X AKL at Al Ikhlas Vocational High School, Pangkalan Susu, Langkat Regency

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Abstract

This study aims to develop an Android-based learning application and compare student learning outcomes before and after using Android-based learning media in Basic Accounting subjects for class X AKL at Al Ikhlas Vocational High School Pangkalan Susu, Langkat Regency. The type of this research is the Borg & Gall R & D model. The stages carried out in the development of this media are the research and information gathering stage, the planning stage, the initial product development stage, the initial field test stage, the first stage of product analysis and revision stage, the field trial stage. Product II revision stage, and product refinement and implementation stage. The results showed that this android-based learning is valid based on the validation results of media experts reaching a percentage of 80% in the Good category, the results of material expert validation reaching a percentage of 76.5% in the Good category and the validation results of learning experts reaching a percentage of 82.7% in the Good category. Thus the android-based learning media developed is feasible to use. The increase in learning outcomes is shown by data analysis from pretest and posttest from the results of the T test which was carried out using the Pired Samples Test with a 95% truth level obtained a significance result of 0.000 <0.05, so there is a significant difference in student learning outcomes between before and after using android-based learning media.

I. Introduction

The rapid changes in human life during the Covid-19 pandemic have undeniably affected the world of education. To limit the spread and transmission of the Covid-19 virus outside in education units, the Ministry of Education and Culture of the Republic of Indonesia adopted a policy through the Circular of the Ministry of Education and Culture Number 15 of 2020 concerning the implementation of learning from home (BDR), both online distance learning (in network) and offline (outside the network). All teaching and learning processes that occur formally at school have completely turned into distance learning (PJJ) at home. Based on observations and interviews conducted in class X AKL Al Ikhlas Vocational High School, during distance learning (PJJ) there are still many students who claim to be bored and tired. Many students complain if they are burdened with various accounting tasks, so they don't get enough rest. The research team also found information that on average students had difficulty in working on case studies managing journal books, especially general and special journals. On the other hand, teachers also complain because they have tried to teach and give assignments so that students do not miss the accounting subject matter. However, the burden of this curriculum seems unrealistic to be applied in an emergency like today.

Al Ikhlas Vocational High School Pangkalan Susu is a school that has facilities to support learning. This is also supported by the ability of students to master the developing technology. However, the use of technology as a learning medium is still very minimal, one of which is an Android-based smartphone. Teachers have not used smartphones as learning media, so students only use printed books and student worksheets. Although the books provided by the school have met national standards, there are still many shortcomings to support students in learning (Millah, 2012). Teachers in their teaching can use Android in giving or delivering subject matter to their students. Guswan (2015) argues that through technological sophistication, the learning process will certainly become more interesting and teachers will be more creative in utilizing technology, so that students' absorption of the subject matter will also be better. The results of Purbasari's research (2013) entitled "Development of an Android application as a Learning Media for Mathematics in Three Dimensional Materials for Class X High School Students" indicate that the application developed is feasible to be used as a learning medium for three-dimensional material.

Android-based learning media is able to improve student learning outcomes (Aziz, 2015). According to Karch (2004), the solution to face the challenges that will occur in learning is to use a smartphone, so with smartphone users. This android-based learning media does not require internet access in its use. Because the media created through Android is in the form of an application that can be opened and stored on a smartphone with an Android system. Briggs (in Sadiman et al., 2010) argues that media are all physical tools that can present messages and stimulate students to learn. Examples are books, films, cassettes, and frame films. If the media carries messages or information with instructional purposes or contains teaching purposes, then the media is called learning media (Arsyad, 2008). While learning is an effort made intentionally by educators to convey knowledge, organize and create environmental systems with various methods so that students can carry out learning activities effectively and efficiently and with optimal results (Sugihartono et al., 2012).

Furthermore, learning media according to Gagne and Brings (in Arsyad, 2011) is a tool that is physically used to convey the content of teaching materials. Classification of learning media based on their nature consists of: 1) auditive media, namely media that can only be heard or media that have sound elements; 2) Visual media, namely media that can only be seen, does not contain sound elements; and 3) Audiovisual media, which is a type of media that in addition to containing elements of sound also contains elements of images that are commonly seen (Sanjaya, 2013). So android-based learning media is one of the audio-visual applications that is used as a means of learning Basic Accounting using a smartphone.

Android is a Linux-based operating system designed for touch screen mobile devices such as smartphones and tablet computers. Android was originally developed by Android Inc., and was financially backed by Google, which later purchased it in 2005 (Wikipedia, 2018). Application components are share important of an Android. Huda (2013) revealed that each component has a different function, and the components are interconnected with each other.

Education is one way to produce quality Human Resources (HR) with experience changes in knowledge, skills and attitudes. These changes can be a capital to improve selfcompetence in facing the era of globalization that always undergoes the change (Sitorus et al, 2019).The development of this android-based learning media is expected to be able to contribute to the world of education, especially in schools in Langkat Regency. In addition, according to the development target of STIKP Al Maksum Langkat in 2022, it will become

a teaching university (Teaching University) that provides activity programs with a focus on the quality of learning in North Sumatra. Therefore, with this research and development STKIP Al Maksum Langkat will become a forum for the community to improve their competence in the field of education through training programs organized by STKIP Al Maksum Langkat.

The problems to be studied are how the process of developing media, how to assess material, media, and learning experts on android-based learning media, and how effective android-based learning media is in improving student learning outcomes. The objectives of this research and development are 1) To find out the process of developing android-based learning media; 2) To find out the assessment of material experts, media experts, and learning experts on android-based learning media for SMK class X AKL; and 3) To find out the effectiveness of Android-based learning media on learning outcomes in Basic Accounting class X AKL at Al Ikhlas Vocational High School Pangkalan Susu?.

Based on the explanation above, it is necessary to design android-based learning media for Basic Accounting subjects, especially in managing journal books, so that class X AKL students at Al Ikhlas Vocational High School Pangkalan Susu have a meaningful learning experience as an effort to improve student learning outcomes.

II. Research Methods

The method used in this study is a research and development method. Research and development methods are methods used to produce certain products and test the effectiveness of these products (Sugiono, 2011). In this study, researchers developed an Android-based learning media for Basic Accounting subjects for class X accounting students. The sample in this study was 32 students of class X AKL1 at Al Ikhlas Vocational High School Pangkalan Susu Langkat Regency. The steps of this research and development include research and data collection, planning, preparation of learning media.

2.1 Research and Development Procedures

1. Research and data collection through surveys, at this stage material selection, school selection, and analysis of student needs are carried out.
2. Planning. At this stage, starting from collecting books, preparing media display designs, collecting graphic and animation materials, and preparing evaluation materials in the developed learning media.
3. The composition of Learning Media. At this stage, it is done by opening the learning media, media titles, and context problems as an introduction to the material, the main menu of learning media, and tests.
4. Expert Validity test. The feasibility of the media needs to be validated by experts, namely media, material, and learning experts.
5. Product revisions are carried out if the learning media still has many weaknesses and shortcomings.
6. Try Field test. In this field trial, quantitative data was obtained from student learning tests which were used to assess whether the product developed was really feasible.
7. Revision of Product II is carried out if after field trials there are still weaknesses and shortcomings.
8. Decimirice and Implementation. Delivering the results of development in the form of basic accounting learning media to users, namely teachers and students.
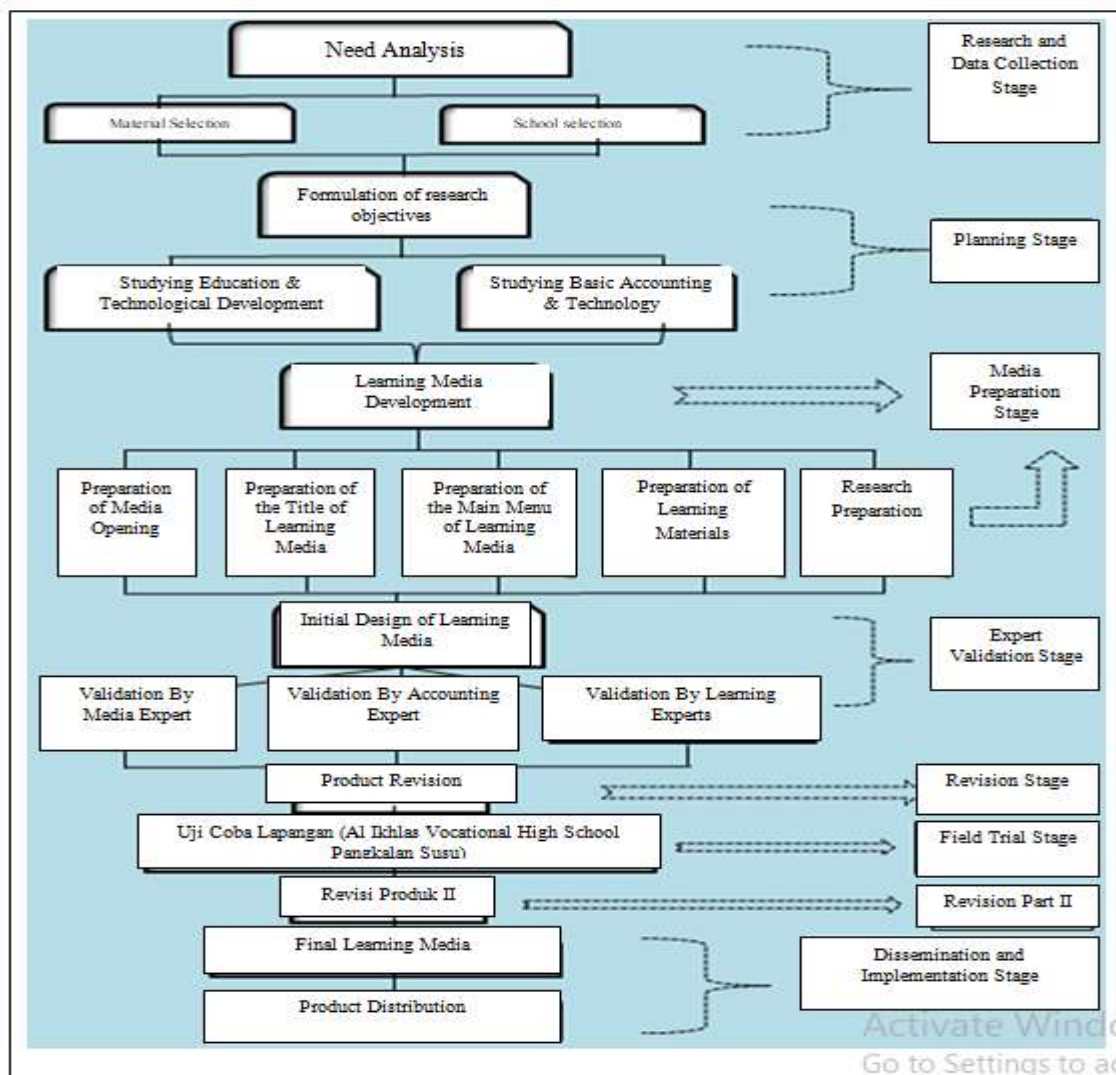
Need Analysis

Material Selection — School selection

Research and Data Collection Stage

Formulation of research objectives

Planning Stage

Studying Education & Technological Development — Studying Basic Accounting & Technology

Learning Media Development

Media Preparation Stage

Preparation of Media Opening | Preparation of the Title of Learning Media | Preparation of the Main Menu of Learning Media | Preparation of Learning Materials | Research Preparation

Initial Design of Learning Media

Expert Validation Stage

Validation By Media Expert | Validation By Accounting Expert | Validation By Learning Experts

Product Revision

Revision Stage

Uji Coba Lapangan (Al Ikhlas Vocational High School Pangkalan Susu)

Field Trial Stage

Revisi Produk II

Revision Part II

Final Learning Media

Product Distribution

Dissemination and Implementation Stage

Figure 1. *Flowchart of Research and Development of Android-Based Learning Media*

2.2 Data Collection Technique

The data collected in this study, namely: 1) Qualitative data was carried out using natural conditions (natural setting), primary data sources and data collection techniques were more on participant observation (participant observation), in-depth interviews and documentation (Sugiono, 2011); 2) Quantitative data is used to determine the feasibility and effectiveness of learning media. The instruments used in this study were the interview instrument sheet, the questionnaire instrument, the observation instrument, and student test result document.

2.3 Data Analysis Technique

The data qualitative learning media development products are analyzed starting from the flow of media creation to the final results of the media along with their assessment. Meanwhile, product quantitative data were obtained from the results of questionnaires by material experts, media experts, and accounting learning practitioners. The scoring sheets are arranged with intervals of 1 to 4. Quantitative data were analyzed using a simple quantitative technique using the percentage calculation as follows:

$$Score\ Percentage = \frac{Total\ Score\ obtained}{Maximum\ Score}\ x\ 100\%$$

Data results were analyzed using interpretation criteria. As a guideline for interpretation, criteria are set as set out in the following table:

Table 1. Criteria for interpretation

Category	Percentage	Qualification
4	86%-100%	Worthiest
3	76%-85%	Worthy
2	56%-75%	Worthy Enough
1	<55%	Worthy

Source: Sugiono (2011)

While to test the differences in learning outcomes before using the media and after using the media, it was done by using the t-test difference test. The researcher tested the t-test using SPSS 16.0 with the criteria if the significance level 0.05, then it was stated that there was a significant difference in learning outcomes, whereas if the significance level results were > 0.05, it was stated that there was no significant difference in learning outcomes.

III. Results and Discussion

This research has produced a research product in the form of an Android-based basic accounting learning media. The android-based basic accounting learning media that was developed was declared feasible to use if the media was valid, practical, and effective. It is said to be valid if it has been validated by material experts, media experts, and learning experts.

This basic accounting learning media uses research and development (R&D) methods using modifications and Borg & Gall development models. Based on the development procedures that have been stated, the making of learning media is carried out in several stages of development to produce the final research product, namely:

3.1 Research and Data Collection Phase

In the research and data collection stage, the researcher conducted an analysis of student needs, material selection, and school selection. The needs analysis obtained by researchers include: (1) Researchers see a problem in learning Basic Accounting Class X Accounting at Vocational High Schools; (2) In the learning process of Basic Accounting Class X Accounting is still traditional, meaning that it rarely uses new media or methods in learning. So that in learning Basic Accounting, students' enthusiasm for learning often decreases so that understanding of the material decreases; (3) The majority of students have android phones, so that it will support and facilitate this research; and (4) determine the research location for media development.

After knowing the problems in learning Basic Accounting for class X AKL, the researchers chose Al Ikhlas Vocational High School Pangkalan Susu Langkat Regency as a place to conduct research. There are 32 students of class X AKL at Al Ikhlas Vocational High School Pangkalan Susu, Langkat Regency.

Figure 2. *Photo of the state of Al Ikhlas Vocational School in Pangkalan Susu*

After making observations, the researchers then conducted interviews with teachers of Basic Accounting subjects at Al Ikhlas Vocational High School Pangkalan Susu, Langkat Regency. From the interviews, it was found that students at Al Ikhlas Vocational High School Pangkalan Susu Langkat Regency had a failure to concentrate and focus when learning Basic Accounting, so that their understanding of the material was weak. Failure to focus on understanding the material is because students are busy with communication tools that should be used to support learning. These supporting tools are used as a medium of communication with cyberspace and peers.

Figure 3. *Interview with Mrs. Dwi Rayana Siregar, S.Pd. as an Accounting Teacher*

Furthermore, the selection of material in this research and development is managing journal books, especially general journals and special journals.

3.2 Planning Stage
This planning stage is carried out with the following steps: (1) Collecting learning resources relating to Basic Accounting subjects with Sub materials for managing journal books (2) Sorting and selecting materials for managing journal books from various learning sources, so that they are relevant and accurate ; (3) Making material notes on Basic Accounting subjects that will be used in media development; (4) Designing a design/layout for the display of materials for Managing Journal Books; (5) Prepare materials needed for media development; (6) Prepare a research instrument in the form of a questionnaire that was validated to 3 expert validators, namely two lecturers and one Accounting teacher at Al Ikhlas Vocational High School Pangkalan Susu; and (7) Prepare materials and project assignments and evaluations in the form of pretest and posttest.

3.3 Media Development Stage

In this research, researchers determine and select the software used to create android learning media, including ISpring Suite version 10, Ms. Power Point, Website 2 APK Builder Pro 3.0.2, and Java 8.

a. Intro

In the intro scene, there are titles, animations, background music and the start button, writing on basic accounting subjects for class X AKL.

Figure 4. *Cover of Android-based Learning Media*

b. Main Menu

In the main menu, there are titles and buttons that point us to the desired menu. Among them are Basic Competencies, Materials, Evaluation of Bibliography, and Author.

Figure 5*. Main Menu of Android-based Learning Media*

c. Basic Competencies

In the Basic Competence scene that is served on android-based learning media, it is adjusted to the revised 2013 curriculum as stated in Permendikbud No. 37 of 2018 concerning KI and KD Curriculum 2013 in primary and secondary education. This basic competency aims to show what students should achieve in this lesson. Basic Competencies in this android-based learning media can be seen in Figure 6 below.

Figure 6. Basic Competencies

d. Material Menu

The learning materials in this media are presented with concept maps about General Journals, Examples of General Journals, and Special Journals, as well as Examples of Special Journals.

Figure 7. Material

e. Evaluation Menu

On the Evaluation menu, students are presented with practice questions, and can immediately answer them, and get corrected answers.

Figure 8. Evaluation

f. Bibliography Menu

The Bibliography menu contained in this android-based learning media, contains all books and scientific writings that are references related to Basic Accounting learning materials. In Figure 9, a bibliography is presented in the following android-based learning media.

Figure 9. Bibliography

g. Author's Menu

The last menu of this android-based learning media is the profile of the media developer as shown in the following picture.

Figure 10. Author/Developer Profile

h. Product Validation Stage

After the process of making Android-based Basic Accounting learning media is complete, the next stage is the need for validation of the developed media. Product validation was carried out by 3 validators consisting of a lecturer at the Development University of Panca Budi Medan, a lecturer at STKIP Al Maksum Langkat, and a teacher at Al Ikhlas Vocational High School Pangkalan Susu Langkat. Validation data is obtained from an instrument in the form of an assessment questionnaire given by the validator. In addition to providing an assessment, the validator also provides criticism and suggestions for product development at the end of the questionnaire. The results of the validation of media experts reached a percentage of 80% in the Good category, the results of material expert validation reached a percentage of 76.5% in the Good category and the results of the validation of learning experts reached a percentage of 82.7% in the Good category.

3.4 Product Revision Phase II

Based on the results of the last field test, this learning media received a positive and enthusiastic response from students. In addition, students can use this learning media easily. In general, this media does not need to be revised again.

3.5 Dissemination and Implementation Stage

At this stage the researcher conveys the results of the development in the form of android-based learning media to users, namely teachers and students, by providing an application download link. The implementation in the development of Android-based Basic Accounting learning media is applied in class X AKL1 Al Ikhlas Vocational High School Pangkalan Susu.

3.6 Data Analysis
Data analysis and T test

This test was carried out on two paired samples, namely testing learning outcomes before using android-based learning media and learning outcomes after using android-based learning media in Basic Accounting subjects in class X AKL1 Al Ikhlas Vocational High School Pangkalan Susu.

Table 2. Test Results of Paired Samples Statistics
Paired Sample Statistics

		mean	N	Std. Deviation	Std. Error Mean
Pairs 1	PRETES	50.43	30	9,751	1,780
	POSTES	79.73	30	6,968	1,272

In the table above, it can be seen that the results of the paired samples statistics test showed that students obtained pretest results with an average value of 50.43, while learning outcomes after using android-based learning media, students obtained an average score of 79.73. The difference of 29.30 (50.43–79.73 = -29.30) indicates that there is an increase of 29.30 from the average before using android-based media.

Table 3. Paired Samples Test Results

Paired Samples Test								
		Paired Differences						Sig. (2-tailed)
				95% Confidence Interval of the Difference		t	df	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper		
Pair 1	PRETES - POSTES	-29,300	8,384	1,531	-32,431	-26,169	19,142	29	,000

Next the table of the results of the pired samples test can be seen that from the data contained in the column Sig. (2-tailed) of 0.000 0.05, it is stated that there is a significant difference in learning outcomes. So it can be concluded that the use of android-based learning media is effective in improving the learning outcomes of class X AKL1 students in Basic Accounting subjects. From the results of testing the data through the T-Test in pairs with the truth level of the test reaching 95%, it can be concluded that the use of android-based learning media in Basic Accounting subjects with "Very feasible" Journal Book material is used in the learning process. This media can be a solution for learning Basic Accounting by maximizing learning media that are always available on smartphones. Smartphones have a good function for students if they can be used properly too.

IV. Conclusion

The material discussed in this Android-based Basic Accounting learning media development product is Journal Books. This development model uses Borg and Gall's research and development model which consists of 8 stages (1) initial research and information gathering stage, (2) planning stage, (3) initial product format development stage, (4) initial trial stage by validation, (5) product revision stage, (6) field trial stage, (7) product revision stage, (8) dissemination and implementation stage.

Based on the results of the media expert test validation, it was declared feasible to use, the results of data analysis from the material expert questionnaire obtained a percentage of 76.5%, which means this product is quite feasible to use. Media experts get a percentage of 80%, which means this product is very feasible to use. Learning experts get a percentage of 82.7%, which means this product is very feasible to use. The results of data analysis from the pretest and posttest from the results of the T test which was carried out with a truth level of 95% obtained a significance result of $0.000 < 0.05$. The significance value is below 0.05 indicating that Ho is rejected. So student learning outcomes in Basic Accounting subjects with android-based learning media there are significant differences, it means that the learning outcomes before and after using the media have different results in a positive way.

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