

# **Development Of Android Application-Based Accounting Learning Media For Basic Competency Of Accounting Cycle On Company Services Of Smk-Bm Level**

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**Abstract:** *This study aims to develop accounting learning media by using the Android application on the Basic Competition of Cycle Accounting on Services Company for SMK Business and Management students of class X level. This study is a research development or Research and Development (R&D) which is adapted from the ADDIE development model. The steps are in 5 steps: 1) Analysis, 2) Design, 3) Development, 4) Implementation, and 5) Evaluation, but it is only done until the fourth step, Implementation. The development result is in the form of Android application that contains material of accounting cycle on service companies. The application which is developed contains six main menus, namely competence, prerequisite, material, evaluation, glossary, and about application.*

**Keywords:** *learning media, android application, accounting on service companies*

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## **I. Introduction**

The use of information and communication technology in learning has become the demands of the times and must be integrated not only in TIK subjects, but also on other subjects such as accounting.

Accounting is often regarded as something difficult, complicated and boring for students. This is common in the SMK/Vocational High School students of class X who is newly familiar with accounting. Negative assumption about accounting one of them is influenced by the inappropriate use of media in teaching and learning process. It cannot be denied that this student assumption will influence the motivation in studying accounting, inside and outside the time of teaching and learning. Accounting is also a productive subject of accounting skills program in SMK, so this subject has more hours in comparison with other subjects. It results in the students getting bored quickly because of more teaching hours, another fact that is accounting learning is still verbal and teacher-centered. Teachers also rarely use the learning media in the activity of teaching and learning when the school has provided many facilities that can be utilized as a learning media. Accounting lessons are delivered only frequently as lectures and question answer. As a result student responses during accounting lessons show poor attitude, the number of students are saturated and bored so that the process of teaching and learning cannot take place properly. From the above problems, they are required an improvement in the teaching system which are used by teachers. One effort that can be done is to develop an effective and fun learning media.

The use of media in the learning process aims to make the learning process be effective and efficient so that the quality of education can be improved (Mariati, 2014: 23). In recent decades, mobile device ownership has been increasing. This is due to the increasingly affordable price of these devices by the public.

The more people who own and use mobile devices, it will increasingly open the opportunities of the mobile technology devices use in the education world. The use of mobile devices in the learning process is then known as mobile learning (m-learning). The presence of m-learning will not be able to replace the e-learning (electronic learning) which commonly cannot replace face to face learning in the classroom. The presence of m-learning is intended as a complement to existing learning and provides an opportunity for students to re-learn the material that is less controlled wherever and whenever. This can certainly provide a different experience in the learning process for students.

Android application development as one of the accounting learning media at the SMK-BM level needs to be developed. The application which is developed is devoted to the accounting material on Service companies. The application is an Adobe AIR-based (Adobe Integrated Runtime) Android application that is in its development progress using Adobe Flash Professional CS6 application. Besides it can be operated on Android devices, this application can also be operated on computer or laptop with Windows operating system.

The purpose of this paper is to develop Android applications that can be used as an accounting learning media of accounting material on service companies for SMK students of Business and Management X class.

## **II. Theoretical Basis**

### **1. Learning Media**

The definition of media in general is a component of learning resources or physical facilities which contains instructional materials in student environment that can stimulate them to learn (Mariati, 2014: 14). In short, media is a tool for conveying or delivering learning messages. Learning media is a tool that is physically used to convey the content of learning materials, which consists of books, tape recorders, cameras, tapes, video recorders, movies, television, slides, photos, graphics, and computers. The use of learning media in the teaching and learning process can generate new desires and interests, generate motivation and stimulation of learning activities, and bring psychological influences on students (Mariati, 2016: 175).

Gerlach and Elly in Azhar Arsyad (2011: 12-14) put forward the characteristics of media which is the reason why the media needs to be used and what things can be done if teacher is less efficient in teaching:

- a) Fixative Characteristic; This characteristic describes the media ability to record, store, preserve and reconstruct an object or event. As an example of historical events that have passed. Students can learn historical events through learning media such as video recordings, documentation, and photographs.
- b) Manipulative Characteristic; Manipulative characteristic is closely related to events that last for days or even years, it can be presented in just a few minutes. Many events or objects that are difficult to observe directly are easily observed through learning media in the form of video and photo recording. For example, students want to study the development of the fetus in the mother's womb for nine months. Through the help of learning media, time can be shortened by showing things that are important only through video recording for example. 20
- c) Distributive Characteristic; Distributive characteristic of media allows an object or event to be transported through space and simultaneously the events are presented to students with a relatively similar stimulus experience. For example the use of CDs, flash disk, and so on can make it easier for teachers to distribute learning materials. The information that is contained therein will always be kept as the original or steady.

Based on the media characteristics above, the practical benefits of the using on learning media in teaching and learning process are as follows:

- a) Learning media can explain the presentation of messages and information so as to facilitate and improve the process and learning outcomes
- b) Learning media can improve and direct the attention of the child so that it can lead to learning motivation, more direct interaction between students and their environment, and the possibility of students to learn by themselves according to the ability and interest.
- c) Learning media can overcome the limitations of the senses, space, and time

### **2. Android Application**

Applications are software that is used for certain purposes, such as processing documents, managing windows and games and so on. Android is an operating system for linux-based mobile devices that includes operating systems, middleware and applications (Safaat, 2012: 1). From that understanding, android application is software in an operating system which is developed and used to process the data into information to meet the needs of users. Sugeng Purwantoro, Heni Rahmawati and Achmad Tharmizi (2013: 177) say "Android is a software that is used on mobile devices that include operating systems, middleware and core applications". Android according to Satyaputra and Aritonang (2014: 2) is an operating system for smartphones and tablets. The operating system can be illustrated as a bridge between the device and its use, so that the user can interact with his device and run applications that are available on the device. Other references find that Arif Akbarul Huda (2013: 1-5) argues that Android is a Linux-based operating system that is specific to mobile devices such as smartphones or tablets. Android operating system is open source so that a lot of programmers who are in droves make applications and modify this system. The programmers have an enormous opportunity to get involved in developing Android applications for that open source reason. Most applications in the Play Store are free and some are paid.

Android operating system is very unique and able to provide convenience for the users because the name of the operating system is always based on the name of the food and begins with the alphabetical sequence such as: Android has several versions of the Android 1.1 version, Android 1.5 version (Cupcake), Android 1.6 version (Donut), Android 2.0/2.1 version (Enclair), Android 2.2 version (Froyo), Android 2.3 version (Gingerbread), Android 3.0/3.2 version (Honeycomb), Android 4.0 version (Ice Cream Sandwich), Android 4.2 version (Jelly Bean), and the latest is Android 4.4 version (KitKat).

### **3. Pocket Books**

Setyono, Sukarmin & Wahyuningsih (2013: 118) thinks pocket books can be interpreted as "books that are small in size, lightweight, easy to carry anywhere, and can be read anytime". The general definition of a pocket book of that understanding is a small book that contains information and can be stored in a pocket so that it is easy to carry around. Through the pocket book, students can get information without wasting much time to know the essence of the information.

### **4. Service Company Accounting**

Service companies are the companies that provide various services. For example: hairdresser, workshop, and car rental. There are 3 steps in Accounting Cycle on service companies; they are the steps of recording, overviewing, and reporting. The material that will be published in the learning media in this study is the material about overviewing step of Accounting cycle on service companies. In the overview step, it will be discussed on the trial balance, adjusting entries, work sheet, closing entries, and the post-closing trial balance

### **5. Previous Research**

- a. Mariati (2017) in a study entitled "Development of Android Application-Based Accounting Learning Media for Basic Competency of Accounting Cycle on Service Companies at SMK-BM Level". This study results indicate that in terms of navigation aspect, it obtains 87% percentage in very proper category; if it is seen from the aspect of ease, it obtains 75% percentage in proper category; in the aspect of visual communication, it obtains 78% percentage in proper category; and as it is seen from the aspect of presentation, it obtains 73% percentage in proper category. While from the assessment of material experts, it can be concluded that as it is viewed from the aspect of learning, it obtains 88% percentage with very proper category; on the aspect of material content, it obtains 88% percentage with very proper category. And as it is seen from the aspect of language, it obtains 85% percentage with very proper category. Therefore, the application which is developed is feasible to be used as a learning media on the material of preparing the accounting basic equation.
- b. Mariati (2015) in a study entitled "Development of Interactive Multimedia on "*Gedutan*" model games learning media in accounting learning to all the students of class X SMK-BM in Medan City. The research result shows that 93% according to validator of learning media of "*Gedutan*" game application, it is very feasible to be used, whereas according to material validator, 97% media learning of accounting educational game model (*gedutan*) is very feasible to serve as learning media. As it is seen from the students' responses, 98% of the 43 students who become respondents declare the "*gedutan*" media is very feasible in the aspect of the software, feasible in the aspect of visual communication and feasible in the aspects of learning. Completeness of students after using the game application media has increased by 94% from the previous one.
- c. Luqman Arumanadi (2014) in a study entitled "Application Development of Pocket Book of Physics (PBOP) as Physics Learning Media of High School Class XI for Android Platform". The research results mention that in alpha-testing according to 44 Media Experts, the application is very feasible in aspect of software engineering (90.67%) and very feasible in aspect of visual communication (91.43%). According to the material experts, the application are very feasible in the aspect of the concept truth (80%), feasible in the aspect of the material depth (72.5%) and feasible in the aspect of implementation (76.9%). In beta testing, according to 30 respondents, the application is feasible in the aspect of software (77.6%), feasible in the aspect of visual communication (79.6%), and feasible in the aspect of learning (76%). Student completeness after using PBoP by 82.6% with very good criterion. With these results, it can be concluded that PBoP applications have positive influence on student learning outcomes in studying materials of energy, effort, and power on physics subjects. The same research which is conducted by Luqman is the same form of development research, learning media in the form of digital pocket book that can be used on Android Smartphone. In addition the development procedure is used together using ADDIE. The difference lies in the material that will be presented. Luqman uses high school physics materials, while in this study using high school accounting material. It also differs in subject and object of study.
- d. Resti Yektyastuti (2012) in a study entitled "Development of Mobile Game Brainchemist as Chemistry Learning Media of High School/MA on Reaction Rate and Chemical Equilibrium Material". The study results produce in an average score of the feasibility quality on chemistry learning media of reaction rate and chemical equilibrium by 110.6 and is within the range of the score  $x > 105$  so it is included in the very good quality criterion (*SB*) with 88.49% product idealization percentage. Based on this study, brainchemist car game is feasible to be used as a learning media of chemistry for high school on reaction rate and chemical equilibrium materials. The same research which is conducted by Resti is the same form of research development; the learning media which is used is Android-based and is made using Eclipse. In addition, development procedures are both using ADDIE. The difference lies in the material which is

presented; Resti uses high school chemicals, while in the study, it uses high school or MA/Islamic High School accounting material. Besides, it is also different in the product which is resulted; Resti creates mobile games applications, whereas in this study the application which is resulted is a digital pocket book. The last difference lies in the subject and the object of her research.

- e. Rohmi Julia Purbasari (2013) in a study entitled "Development of Android Application as Learning Media of Mathematics on Three Dimensional Materials for High School Students of X Class". The research result states that the feasibility test result is 96.43% for media expert, 89.28% for material expert, 81.52% for field practitioner and 83.49% for 46 user goals. Therefore, the application which is developed is feasible to be used as a learning media on three dimensional materials. The similarities of Rohmi's research are both in the forms of development research. In addition, the development procedure both uses ADDIE. The difference lies in the material which is presented; Rohmi uses high school mathematics materials, while in this study, it uses high school accounting material. Besides it is also different in the tools of Android developers; Rohmi uses Adobe AIR (Adobe Integrated Runtime), while in this study, it uses Eclipse. The last difference lies in the subject and the object of his research

### **III. Research Methods**

The study steps that are conducted refers to the model of ADDIE development which is developed by Dick and Carey (1978), including Analysis, Design, Development, Implementation and Evaluation. The steps are the analysis step (goal analysis, curriculum and material analysis, capability level analysis and user target characteristics), design (design of material items to be presented, the preparation of material script, the preparation of material delivery flow in the form of flowcharts, the making of storyboard media, and the collection of materials which is needed in media development), development (making media by using Adobe Flash Professional (CS6) software, implementation (assessment by media experts, material experts, and field practitioners and the implementation of limited trials), and evaluation (assessment of media which is developed, it is conducted for four previous steps).

This study is conducted at 3 SMK BM schools that are located in Medan city which will be implemented in January 2017 until December 2017.

This study procedure adapts the ADDIE development model, which is a development model consisting of five steps: Analysis, Design, Development, Implementation and Evaluating. However, in this study report, it is just at the implementation step of assessment by media experts, material experts, and field practitioners only.

#### **1. Analysis Step (Analysis)**

- a. Analysis of student needs include the needs and characteristics of students who will become the target users of hardware and software.
- b. Analysis of competence and instructional includes analysis of Competency Standards (SK) and Basic Competence (KD) which will be published in this media. The Competency Standards that will be published is the Understanding to Accounting Cycle of Service Companies with Basic Competencies in Making an Overview of Accounting Cycle of Service Companies. Instructional analysis is the elaboration of Basic Competence (KD) that has been selected at the competency analysis step into a learning indicator that allows to be presented in android applications.

**2. Design Step (Design)** Based on the analysis results, the next step is design or product design step covering the following steps:

- a. Media Design Making (storyboard)  
Storyboard is an overview of the overall learning media that will be loaded within the application. Storyboard serves as a guide. It is like a map to facilitate media creation process.
- b. Material Establishment, at this step, is presented basic selection of accounting subjects about the overview of Accounting Cycle in service companies. Accounting is chosen because it is in accordance with the author competence. In addition, there are difficulties in the lack of instructional media use and many teachers are still using conventional methods or lectures in teaching Accounting.
- c. Compilation and Answers of Problems and discussion of answers and duration of time that are required to answer every item will be published in the media. Preparation of materials, problems, and discussion in this media is made from various references.
- d. Assessing Subjects to Curriculum of competence Standards, understanding the Accounting Cycle in service companies with Basic Competencies Making an Overview of Accounting Cycle in Services Companies are reviewed in accordance with current school curriculum guidelines.
- e. Collection of backgrounds, fonts, images, and buttons

The collection of backgrounds, fonts, images, and buttons is downloaded from various sources and then it is created in PNG (portable network graphics) image format using PhotoShop CS 4. When it is converted into the format, the background image will appear to have a transparent background so as to make media more interesting.

### **3. Development Step (Development)**

#### **a. Creating Learning Media Products In the form of accounting learning games**

At this step, the learning media products are made in accordance with predefined format that is through the early design step by using a computer device. The goal is to more easily move the design of these games into the android media.

#### **b. Validation of Material Expert and Media Expert**

The validation process is done by media experts and material experts. The results are suggestions, comments, and inputs that can be used as a basis for analyzing and revising the media which is developed and as a basis for product testing on students.

#### **c. Validation of Practitioners on Accounting Learning**

The validation process is done by accounting learning practitioners in schools. The results are suggestions, comments and inputs that can be used as a basis for analyzing and revising the media which is developed and as a basis for product testing on students.

### **4. Implementation Step (Implementation)**

This implementation step of the product will be tested to 30 students from SMK-BM PAB 03 of Medan Estate. At this step, it is also distributed questionnaires to measure and to know the opinion or the response of learners about learning media application for accounting learning about the overview of accounting cycle on service companies. If it is necessary then it will be revised based on input and suggestion from learners. However, in this revision, it will be considered input and suggestions from previous validators so as not to conflict with previous improvements.

## **IV. Research Result And Discussion**

### **4.1. RESEARCH RESULT**

The development results of this research are an Adobe AIR-based Android application that contains material of service company accounting cycle. In addition it can be operated on Android devices. This application can also be operated on a Windows-based computer or laptop. The minimum requirements that are required to run this application on the Android device are

1. ARMv7 processor with FPU vector, minimum 550MHz, OpenGL ES 2.0, H.264 and AAC HW decoders.
2. Minimum Android 2.2 (Froyo)
3. RAM 256MB

Meanwhile, the minimum requirements that are required to run this application on a computer or laptop with Windows operating system are

1. 2.33GHz or faster x86-compatible processor, or Intel Atom™ 1.6GHz or faster processor for netbook devices.
2. Microsoft® Windows® XP, Windows Server 2008, Windows Vista® Home Premium, Business, Ultimate, or Enterprise (including 64-bit editions) with Service Pack 2, Windows 7, or Windows 8 Classic.
3. 512MB of RAM (1GB is recommended).

Based on the development procedure that has been described previously, the development of learning media on android-based games model is done in several steps:

#### **a. Analysis**

Analysis of needs, it needs to be done before doing development design of learning media in this case is field study and literature study.

##### **1. Problem analysis**

At this step, it is done the investigation and survey of problems that occur in the teaching and learning process in school and then identifying how the right solution to solve the problem.

Based on the observation results, the problems that occur in the field are:

- a) Accounting is still considered as a difficult, complicated and boring learning for students, this is caused by accounting learning is still verbalist and teacher-centered, the result is many students whose value has not reached *KKM*/minimal mastery criteria, so it needs to be developed a more creative, interactive and innovative learning media.
- b) The use of learning media that are less precise in learning so it needs in the development of media that is not only creative, interactive and innovative but also in accordance with the demands of the times. Like the

use of eg computer. Then the media which is chosen to be developed is an android applications-based on learning media.

## 2. Media Content Analysis

In the preparation of instructional media, it is needed learning components such as competence standards, basic competencies, indicators and learning objectives and content material. The content of instructional media contains accounting.

### **b. Designing**

In the process of designing the learning media design, it is necessary to have a design sketch which is used to describe the media making. The sketch is formed in a storyboard.

### **c. Testing**

In the testing step, the learning media is examined. At this step, the things that are checked include the accuracy of navigation, whether there are errors in the grant of the command, whether the navigation can be accessed, checking on material errors, and writing mistakes in the media. At this step, the media is validated by the validator, Mr. Uun Ahmad Saehu as the media expert and Mrs. Novariani S.Pd as a material expert, to find out whether the media is feasible to be used as a learning media in accounting lessons. Validator by media expert and material expert is done twice.

### **d. Publishing**

This step is the step of which the media design that has been made is exported for easier without having to install adobe flash player 9.0 software to open it.

### **e. Packaging**

At the packing step, the file from the learning media that has been finished to design is incorporated into a well-designed CD to appeal the students. Packaging in the form of CD is done to facilitate the user in using learning media.

### **f. Media Expert Validation**

Learning media validation of this game model is done by lecturer of media expert in study program at Faculty of Teacher Training and Education in University of Muhammadiyah Sumatera Utara whose study is related to learning media. Validation is done by filling in a questionnaire and providing suggestions for improvement.

### **g. Trial Results on Learning Media of Games Model**

From the trial results that are conducted in three SMK in Medan for 15 people in each school, it is obtained the results of student responses to the media are:

1. SMK Budisatrya Medan gets 91% percentage and it indicates very proper criteria and the assessment results of student responses as in review of the average value by 64 is very good.
2. SMK-BM Sinar Husni Medan gets 94% percentage and it indicates very proper criteria and the assessment results of student responses as in review of the average value by 66 is very good.
3. SMK PAB 2 Helvetia gets 95% percentage and it indicates very proper criteria. and the assessment results of student responses as in review of the average value by 67 is very good.

### **h. Final Product and Distribution**

The end product of this development research is the learning media application of android-based game model of accounting education has not been completed to be applied to the android because it is still in feasibility test. The development process is still underway. And it will be applied when students enter school in the new school year of 2017-2018.

## **V. Discussion**

Learning media which is developed in the form of Adobe AIR (Adobe Integrated Runtime)-based Android application that can run on Android-based mobile devices so that the learning media which is developed can be run anytime and anywhere. This learning media is included in the mobile learning-based learning media category.

In this application, there are some main menu, the menu of material information in which is divided into eight (8) sub menus, they are: understanding the basic equation form of accounting, the basic equation elements of accounting in which consists of assets, liabilities, capital, income and load, while the last menu is a

sample problem. In addition to the menu of material information, inside it, there is also a play menu that begins by filling in the student name and the start sign.

The "About Applications" menu contains a brief overview about the application. The existence of these menus allows users to choose their own content which will be learned. Based on the results of trials that have been done, it is obtained the results of the learning media application which is developed by the author is feasible to use.

The application which is developed in this study cannot be run on all kinds of mobile devices considering this application can only run on Android-based mobile devices. Therefore, it is expected to be done the development of similar applications that can run on devices with the different operation system and on different materials. With the development of learning applications on mobile devices, they are expected to improve the benefits of mobile devices in the field of education and to provide learning motivation to students. In addition, the existence of the applications can provide interesting and new learning experience for students.

## **VI. Conclusions And Suggestions**

### **6.1. CONCLUSIONS**

The product which is developed is learning media in the form of Android application. It can also be operated on a computer or laptop with Windows operating system. The application installer is packaged in a compact disc (CD). This application presents four sub-discussion material (indicator), they are (1) explaining the basic equation of accounting, (2) identifying the basic equation form of accounting, (3) describing the definition of assets, liabilities and equity (4) recording transactions into the basic equation of accounting.

In this application, there are some main menu, the menu of material information in which is divided again over eight (8) sub menus of understanding in the basic equation form of accounting, the basic equation elements of accounting in which consists of assets, liabilities, capital, income and load, while the last menu is a sample problem. In addition to the menu of material information, inside it, there is also a play menu that begins by filling in the student name and the start sign.

From the assessment results of media experts, it is concluded as it is viewed from the aspect of navigation, it is obtained 87% percentage in the very proper category, as it is viewed from the aspect of ease it is obtained 75% percentage in the proper category, in the aspect of visual communication it is obtained 78% percentage in the proper category, as it is viewed from the aspect of presentation it is obtained 73% percentage in the proper category. While from the assessment of material experts, it can be concluded as it is viewed from the learning aspect it is obtained 88% percentage with very proper category, on the aspect of material content it is obtained 88% percentage with very proper category. And if it is seen from the aspect of language, it is obtained 85% percentage with very proper category. Therefore, the application which is developed is feasible to be used as a learning media on the preparing material in the basic equation of accounting.

Learning media which is developed has several advantages and disadvantages. The advantages of learning media which is developed that it can be operated on android and Windows-based devices; it presents accounting material in interesting way and is easily to understand; it presents the examples of problems with varying degrees of difficulty; the material presentation comes with pictures and animations to help students understand the material.

In addition to the previously advantages that have been mentioned, the learning media which is developed also has disadvantages. The disadvantages of learning media which is developed are it cannot be operated on the mobile device with operating system other than android 3D animation; and media interactivity is still lacking.

### **6.2. SUGGESTIONS**

Based on the media quality, the disadvantages and limitations of the research have been discussed earlier the researcher may provide some suggestions for further utilization and media developments as follows:

1. This learning media of accounting needs to be developed further on a clearer image display or images with HD quality (High Definition) and moving animation and video.
2. Learning media of accounting needs to be developed in terms of material which is more widely. The material which is presented does not only contain three Basic Competencies (*KD Kompetensi Dasar*) but it can be developed by loading the wider material.
3. This application needs to be developed in terms of problems. The problem variation is less diverse because the problem still remains unchanged even though the user has been working overall.
4. Learning media applications of accounting which is based on Android needs to be developed further in terms of smartphones. This application should be installed on all operating systems other than the Android, for example I-phone Operating System, Windows Phone, and Blackberry.

5. For further research, trials should be conducted more widely. Testing is not only done in one class, but the trial should be done in more than one class or more than one school so that it can produce learning media that can be widely used.

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