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Developing Android Game-Based Learning Media "Go Accounting" in Accounting Learning

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Abstract

This study aims to: (1) develop android game-based learning media "Go Accounting" in trading company accounting learning (2) reveal the feasibility of the develop learning media according to material experts, media experts, teachers, and student. This study is research and development that refers to the ADDIE model. The subjects of the trial are the students of class XI accounting of vocational high school. The data collection is done through interviews and questionnaire. The instruments used are interview guide, expert validation questionnaire, teacher response questionnaire, and student response questionnaire. The feasibility of the develop learning media is analyzed using the quantitative 5 category conversion. The result of this study is Android game-based learning media "Go Accounting". The development of learning media is feasible according to material experts, media experts, teachers, and students each of whom subsequently gave a score of 4.18, 4.35, 4.70, and 4.22.

1. Introduction

Learning media is a teacher's tool in conveying messages to students (Harsono et al, 2019). Thus learning media aims to facilitate the teacher in delivering material to students. In this case the learning media plays an important role in the accounting learning process.

Based on preliminary observations made by writers at vocational high school, accounting learning carried out is still verbal and teacher centered. In teacher centered learning, the teacher becomes the center of learning so that the teacher's activities in learning become very dominant (Dole et al, 2016). This is the main factor that influences the behavior of students being less active and creative. To make students active and creative, innovative learning is needed.

Learning media used by teachers are relatively the same from one meeting to the next. The teacher uses Microsoft Office Power Point learning media during learning. One innovative learning is learning that uses learning media. Some researchers already developed learning media and show significant result (Odewumi, 2019; Hermawan, 2018).

The emergence of the Android system is one of the media for teachers to utilize this media in accounting learning. Currently Android ranks first as the most popular mobile operating system in Indonesia (Hermawan, 2015). Based on StatCounter Global Stats data until February 2019 Android OS mobile users in Indonesia reached 50.13% followed by Windows in second place with 36.55% users. Whereas in the global scope Android also ranks first with a number of users of 36.5%. Android is very appropriate to be used as a learning media to facilitate students in understanding accounting learning material (Onan et al, 2018).

In fact, the use of Android in today's students is more on social media in the form of instagram, whatshap, facebook, twitter, youtube, and other social media. This shows that the use of Android is not optimally as a learning media. Android game application as a learning media that can facilitate students in understanding this learning material named Android game "Go Accounting".

The previous studies show the positive impact of using Android games as a learning media. The results of research conducted by Poh-Sun Seow and Suay-Peng Wong show that the Android game-based learning media "Accounting Challenge" in accounting learning is able to increase student interest and motivation (Seow, 2016). Learning media also designed to enhance students' creativity regarding the subjects being discussed and able to introduce technology (Novaliendry, 2013). Some of the results of this study support this research to develop an Android-based learning media in accounting learning.

This phenomenon is the background of researchers to conduct research on developing "Go Accounting" learning media.

This development research produces learning media that are creative, effective, and fun. This research also intended to increase the use of Android games as a media for accounting learning.

The word media comes from Latin and it is the plural form of the word media which literally means "middle", "intermediary", or "introduction". This term refers to something that can convey information from the source to the recipient of the message (Arsyad, 2017). Media as a communication channel used to convey messages between the provider of the message and the recipient of the message (Smaldino et al, 2004). Whereas according to Costello et al., defines media as "ways of transmitting and compressing all of the various technologies we use to record information and transmitting it to others" (Costello, 2012). So that the media is a transmission that includes all technology to record information and send it to others.

Learning media is everything that can be used to channel a subject's content, stimulate thoughts, feelings of concern, and students' abilities so as to encourage the teaching and learning process (Ibrahim & Syaodih, 2013). Learning media is everything that can be used to channel messages from communicators to communicants so that they can stimulate students' thoughts, feelings, concerns, and interests so that the learning process takes place (Sadiman et al., 2011). Learning media is various components in the environment that can stimulate student learning activities (Gagne et al., 2004). From several definitions it can be concluded that learning media is everything that can be used as an intermediary to channel messages from communicators to communicants so as to facilitate the learning process.

One element of the game according to Prensky is "games are a form of fun and play that provides anjoyment and pleasure to all of us" (Presnsky, 2001). The game is an activity, tool, or object that can be fun. Games on Android are already soaring in popularity and the demand for more challenging games increases (Hassan, 2016).

Learning by playing provides opportunities for children to manipulate, practice, and get consumerable concepts and understandings (Sudono, 2000). Enjoyment and fun are important in a learning process (Prensky, 2001). Games as an educational media have many roles (Sadiman et al., 2011). Educational games as media learning, have six characteristics, namely fantasy, rules, and goals, sensor stimuli, challenges, mysteries, and controls (Rothschild, 2008).

Mobile games are games that can not only be played through cellular phones, but can be developed in various mobile handsets (Lam, 2005), In this study designed games that can run on mobile devices on the Android platform suggest that the advantages of mobile games compared to other similar games are development costs that are not as expensive as game consoles, and mobile games have a broad market (Kawagoe, 2012; Marpaung et al., 2014). Boot et al (2011) found that from several studies using games in learning can improve student performance and cognition.

A trading company is a company which main activities are buying merchandise and then reselling without changing form. The process of trading company accounting activities includes the recording phase, overview phase, and the reporting phase. Adjusting journal entries is a journal that is made to show the true financial condition of the company. Adjusting journal entries are important studies in trading company accounting.

In the international encyclopedia on social science, mentions that R&D research and development is a term commonly used to describe activities carried out by companies or individual entrepreneurs to create new products and processes that are better (Hall, 2008). Development research is one form of descriptive research (Koh, 2000). Descriptive research aims to describe the process and examine a symptom that occurs in research (Sunyoto, 2013).

The idea of developing ADDIE first appeared in the mid 1970s made by the Center for Educational Technology at Florida State University for the U.S. Army. and then adapted by all U.S. Armed Forces (Watson, 1981). ADDIE is an acronym for Analysis, Design, Development, Implementation, and Evaluation (Branch, 2010). The researcher chose the ADDIE development model because this model can be used for various forms of product development such as models, learning strategies, learning methods, learning media, and teaching materials.

The model chosen to develop the Android game-based learning media "Go Accounting" is the ADDIE research and development model. This is based on consideration; among the development models that have been described, the ADDIE model is the best and most complete research and development model (Piskurich, 2015); the ADDIE model is a procedural model that has been used in many development research oriented learning media products (Branch, 2010); the stages in the ADDIE development model are in accordance with the standards, can be monitored (Piskurich, 2015); the development of ADDIE is easily

implemented in research and development (Piskurich, 2015).

2. Method

The type of research used in the preparation of this study is Research and Development (R&D). Research and Development is a research method used to produce certain products and test the validity of these products. Research and development contains steps to develop a new product or improve existing products, which can be accounted for. The research subjects in this research and development are class XI accounting students and financial institutions. The total sample is 155 students.

The procedure for developing an Android game-based accounting learning media "Go Accounting" consists of five stages, namely:

Analyze The first stage is the analysis of needs to determine the problem and the right solution for students. New learning media requires analysis to determine the feasibility of the learning media that is applied. The Analyze phase consists of selecting the material to be developed, determining learning objectives, checking the foundation of development, confirming prospective users, and identifying the necessary resources, developing a project management plan.

Design The design phase consists of creating a story board, creating and collecting content, and choosing a test and preparation test strategy.

Develop The steps taken at the develop stage are building the product, developing product usage guidelines, and conducting expert validation.

Implement The implement stage consists of preparing students, using products, and analyzing data obtained from students to find out the assessment of the "Go Accounting" learning media made.

Evaluation The evaluation phase has the purpose of evaluating products developed at each stage of ADDIE. After the implementation phase, the activity carried out is to analyze the changes resulting from the use of the product to see the quality of the product. The expected change is an increase in student learning outcomes in trading company accounting learning. The use of the learning process provides suggestions and recommendations for improvement. Products are revised and reproduced into final products.

Data collected is quantitative data. Data collection techniques in this research and development are using interview guides and questionnaires. Guidelines for interviewing teachers are used to obtain information in the form of material that will be used in the media and the difficulties of students in learning. Questionnaires are used to assess media validity based on material experts, media experts, learning practitioners, and students. The instrument used to collect data in this development research is in the form of interview guidelines and product assessment questionnaires.

Analysis of questionnaire instrument data comes from questionnaires on product validity assessment given to media experts, material experts, accounting learning practitioners, and students. The validity assessment of Android games is obtained through the following analysis.

Table 1. Provisions for Granting Scores

Category	Value
Strongly Agree	5
Agree	4
Less Agree	3
Disagree	2
Strongly Disagree	1

The data collected is analyzed by calculating the average score with the formula:

$$\bar{X} = \frac{\sum X}{N}$$

Information:

$\bar{x}$ = average score
$\sum X$ = total score
N   = the number of trial subjects

The average rating obtained is converted back into the game feasibility category so conclusions can be drawn about the quality of the game based on the ideal conversion guidelines outlined in the table below

Table 2. Score Conversion Guidelines

| Value	Formula	Range	Classification
5	$x > \bar{x}i + 1{,}8\ SBi$	4,21 - 5,00	Very feasible
4	$\bar{x}i + 0{,}6\ SBi < x \leq \bar{x}i + 1{,}8\ SBi$	3,41 – 4,20	Feasible
3	$\bar{x}i - 0{,}6\ SBi < x \leq \bar{x}i + 0{,}6\ SBi$	2,61 – 3,40	Less feasible
2	$\bar{x}i - 1{,}8\ SBi < x \leq \bar{x}i - 0{,}6\ SBi$	1,81 – 2,60	Not feasible
1	$x \leq \bar{x}i - 1{,}8\ SBi$	0 – 1,80	Very not feasible

Information :
$\bar{x}i$ = (Ideal Average)
  = ½ (ideal maximum score + ideal minimum score)

SBi = (Ideal Standard Deviation)
 = 1/6 (Ideal Maximum Score-ideal minimum score)
$\bar{x}$ = Ideal score

3. Result and Discussion

The assessment results from experts are used as a validation of the product. There are 4 validators, namely media expert validators,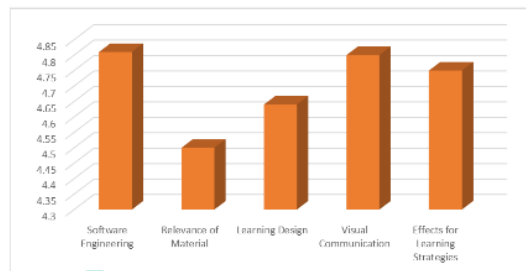 material expert validators, and 2 learning practitioner validators. The following are the results of the material expert validation analysis.
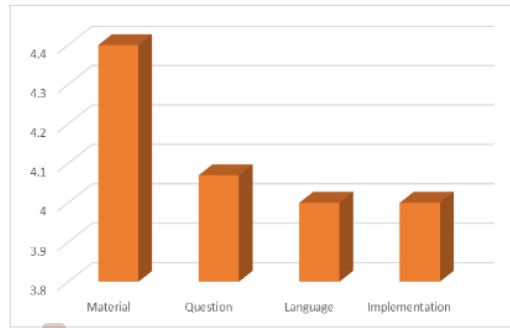
Figure 1. Graph of Material Validation Results
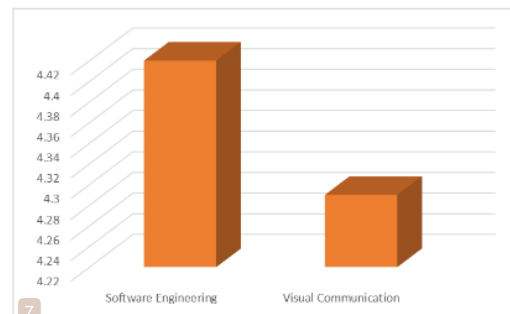
Figure 2. Graph of Media Expert Validation Results

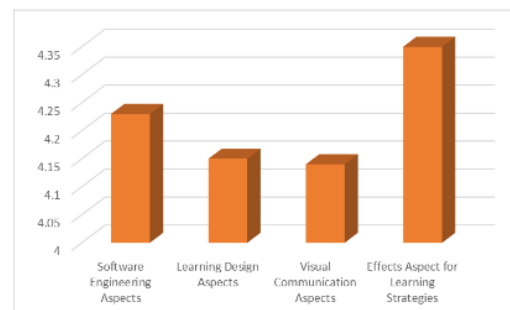**Figure 3. Graph of Results of Validation of Accounting Learning Practitioners**

Figure 4. Graph of Student Validation Results

Figure 4. Interface Go Accounting

Figure 1 shows the results of the material expert validation graph. In this validation which is assessed by material experts in the form of material aspects, question aspects, language aspects, and aspects of implementation. Validator material experts give an assessment score of 4.18 with an average on as rating scale of 1 to 5 for the product developed.

Figure 2 shows the graph of the results of the validation of media experts. In this validation which is assessed by media experts in the form of software engineering aspects and visual communication aspects. The media expert validator provides a score of 4.35 on the product with an average on the rating scale of 1 to 5.

Figure 3 shows a graph of the results of the validation of accounting learning practitioners. In this validation the learning practitioner assessed aspects of software engineering, aspects relevance of material, aspects of learning design, aspects of visual communication, and aspects of effects for learning strategies. Validators of learning practitioners provide an assessment score of 4.70 with an average on a rating scale of 1 to 5 for the product developed.

Figure 4 shows a graph of student validation results. In this validation students assess aspects of software engineering, learning design aspects, visual communication aspects, and aspects of learning strategies. Students provide an assessment score of 4.22 with an average on a rating scale of 1 to 5 for the product developed.

Figure 5 shows the product developed contains text, image, animation and sound content. The storage space that must be provided to install the Go Accounting APK is 45 Mb. The product developed has educational characteristics that incorporate the concept of the game and provide journal material for trading company accounting adjustments.

Based on the assessment of material expert validators, media experts, accounting learning practitioners, and students the products are worthy of being used in learning.

The contents of the trading company accounting adjustment material contained in the products are arranged sequentially. Products can be used by students to study independently.

4. Conclusion

Based on the results of the discussion presented, the products produced can be summarized as follows:

a. The resulting product is an Android game-based learning media "Go Accounting" in trading company accounting learning. The application "Go Accounting" has a capacity of 45 Mb and can be downloaded on the Google Play Store.

b. Products produced from the development stage are assessed by material experts in eligible criteria, with a score of 4.18 from the maximum score 5. Media experts provide an assessment score of 4.35 from the maximum score 5. Accounting learning practitioners give a score of 4.70 from the maximum score 5. This assessment is given by 4 validators, namely material experts, media experts, and 2 practitioners of accounting learning. Learning media are assessed by students in very feasible criteria, with a score of 4.22 from a maximum score of 5. So that from the validity aspect, the product produced is considered valid.

As explained in the final product review section, the products produced from this research and development have valid quality. The suggestions given for product utilization are as follows:

a. Limitations of accounting adjusting journal accounting material contained in this application so that it should be used as a learning resource for additional accounting materials for trading companies of class XI accounting and financial institutions.

b. Teachers and students can use the shareit and midrop application to share applications with others. It is better to check the availability of Wifi in schools to speed up the process of installing "Go Accounting" learning media on student smartphones.

c. In order to see student scores as a whole, the teacher can manually record student scores.

d. Before using the product in class, the teacher needs to pay attention to the smartphone specifications of the student whether it is appropriate to use the learning media "Go Accounting" which is a minimal Android OS Lollipop 5.

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