

Development of Android Based Learning Media on Multimedia Learning Courses

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Abstract. This research aims to understand the development of android based learning media on Multimedia Learning Courses in order to recognize the efficacy of those media on the multimedia learning courses. The research type that is used is the *Research and Development* (R&D) method. Research is done in order to gain the informational needs of the user (*needs assessment*) through data gathering and analysis on the process of expert validation and empirical validation or trial. Moreover the development focuses on the product which is the result of the research itself. The development model being used is the combination of \$D\$ model development and ADDIE development model. There are 4 phases in this research : Needs analysis, designing, development and evaluation. The result of the media development of the Multimedia Learning Courses results in the output of android based learning media which would be developed using the ADDE development model (*Analyze, Design, Development, Evaluate*). Learning media efficacy used in the Multimedia Learning Courses were deemed "Very Reasonable" in its use in Multimedia Learning Courses in accordance with validation results that were done by media expert and the trial results on the students.

Keywords : Multimedia Learning, Android Based Learning, Research and Development

INTRODUCTION

According to [1, p. 134] learning in its essence is a process of interaction between the teachers and students, whether it is a direct interaction or indirect interaction that uses learning medias. Learning medias is a tool that can help the learning and teaching process and it also functions to re-iterate the lesson being taught in order to reach a more proper and perfect learning process. [2]

Smartphone which operates using *Android* systems is being uses by multiple level of society. Whether it is adult or children, middle class or lowered class are all allured by its sophistication. The cheaper price of communication tools equipped with this particular multimedia application results in exponential growth and spread of *Android Smartphone* which touches all layers of society without exception whether its student or teachers.

Seeing the potential, the author realize there plenty of things to be applied in order to use the potential in the multimedia feature of *Android Smartphone* which in its essence is part of *Mobile Learning* study method.

Multimedia learning method is one of the courses being taught in Faculty of Electronic Engineering Education which involves a study which synergizes a myriad of medias as a tool to assist educators in the learning process.

There are plenty of materials that needs to received by the students which faces time constraint of the study period. Study process which takes places only once a week with 150 minutes of direct meeting. The time allocation were felt to be inadequate and

inefficient which causes the course taker to feel difficulties in following the courses, because of the relative length between meetings, in conjunction with other courses which also requires the student's attention. Therefore, there needs to be a representative media which can be repeated at the student's leisure.

Based on experience and initial observational results that were done on the multimedia learning courses in Department of Electronic Engineering Education, Faculty of Engineering Makassar State University, which is the need of a learning media which has undergone a process of validation is still lacking and the needs for learning media is still very limited, which results in student lacking in understanding in Multimedia Learning, therefore there needs to be an effective media which connects students and teachers outside of learning hours. The solution to address the learning problem in class in terms of taking advantage of technology usage in the world of education. Learning media that is used in this research is *android* based media. Android based media aims to assist lecturers and students when both are incapable, to organize class and also communication with the students without the bind of learning hours. Based on the aforementioned explanation, the author conduct a research about learning media development, which lead to the tittle of Development of Android Based Learning Media on Multimedia Learning Courses. Moreover, in regards to the problem in the research is this :

How to create development of learning media on multimedia learning courses using *android* based media?

THEORETICAL STUDY

1. Literature Review

According to [1, p. 219] studying is change as a result of an interaction. However [3] defined studying as a complex process which is experienced by everyone in their lifetime. Studying occurs because of interaction between someone and their environment, therefore studying can occur anytime and anywhere. Almost in conjunction with Azhar Arsyad, according to [4, p. 2] studying is all kinds events/process that every individual experienced all their life starting from infancy and until the day they die. According to him, one of the signs that a person has learned is a change in his behavior.

Changes in behaviour involves changes that are cognitive, psychomotor and affective. The author can find the meaning of learning from various sources and literature, even though the definitions put forward are different from each expert, the author will find similarities in principle. After comparing and seeing the similarities of these three opinions, it can be concluded that learning is a change in one's cognitive, psychomotor and affective. These three changes are the result of a complex process that occurs in all individuals throughout their life or the author call it the outcome of learning.

According to the National Education System Law Number 20 of 2003 which states that learning is a process of interaction between students and educators and learning resources in a learning environment. Meanwhile, according to [1, p. 19] learning is a process in an endid which consists of various elements / components that

are interconnected with one another, these elements / components are: objectives, materials, methods, and evaluation. As for the opinion [5, p. 9] places learning as a process of transferring information or transfer of knowledge from educators to students.

Based on these three opinions, it can be concluded that the learning process is a process of transferring knowledge or knowledge consisting of several components that are in one endid. The process of transferring knowledge or knowledge occurs between teachers and students in the same or different time and space. Therefore, the learning process can be carried out where, when and by anyone with the condition that one acts as a teacher and the other acts as a student and both of them carry out a communication as a medium for transfer of knowledge, both teachers and students who are in the space and time dimensions. the same or different.

a. Learning Media

The term media comes from the Latin medias and literally means "middle", "intermediary" or "introduction". The intermediary referred to in this case is defined as a tool in the learning process carried out by teachers and students. In the learning process there are two important things to determine learning outcomes, namely teaching methods and learning media. The important role of learning media in a learning process is as a tool in the learning process to create an effective situation and condition in an effort to improve student learning outcomes.

According to [3, p. 119] The main function of learning media is as a tool used in the learning process which also affects the climate, conditions and learning environment that are organized and created by educators. Meanwhile [4, p. 17] said that generally educational media is useful for clarifying the presentation of messages, overcoming space limitations, using appropriate and varied educational media to overcome the passive attitude of students and overcoming the problems of unique characteristics of each student with different environments and experiences, while the curriculum and education material is determined the same for each student, so the teacher experiences many difficulties when all of them must be resolved by themselves, namely by their ability to provide the same stimulant, equate experiences and cause the same perception.

Based on these opinions, it can be concluded that the main function of learning media is teaching aids to clarify the presentation of messages, overcoming space limitations, causing learning excitement. This allows for interaction between students and the environment and reality, even allowing students to learn individually according to their abilities and interests. So, by presenting a learning media in the learning process, it will really help teachers to convey messages that are difficult to explain if they only rely on explanations without using the help of learning media.

According to [1, p. 62] There are media that can be used to present material and there are media whose use is very dependent on the presence of an educator or mentor (teacherindependent). Learning media if viewed from its type, can

be grouped into 4 types, namely audio media, visual media, audio-visual media and all kinds of media. Audio media can be radio, audio, taperecorder, and telephone. Meanwhile, visual media can take the form of silent visual media: posters, books, magazines, newspapers, reference books and other printed goods, pictures, illustrations, clippings, frame / idea films, film strips, transparencies, microfls, overhead graphic projectors. , charts, diagrams, sketches, cartoons and maps. Based on the above opinion, it can be seen that the media in general can be grouped based on their purpose and how they are used. However, if viewed from the type, it is divided into 4 types based on variety and form, namely audio media, visual media, audio-visual media and all kinds of things.

b. Android Based Media

1) Android

According to [6, p. 2] Android is a Linux-based operating system for cellular phones such as smartphones and tablet computers. An operating system (OS) is a set of programs that manage computer hardware resources and provide general services for software applications. The operating system is the most important software component in a device, without an operating system, users cannot run application programs on their device unless it is self-booting. So it can be concluded that the Android operating system is a software that runs on devices with certain specifications such as smartphones and tablets.

Currently, Android has specifications that can be said to match computers in terms of processor performance and RAM capacity. Utilization of this hardware makes Android rich in features, according to [6, p. 8] are some of the features that Android has, namely the existence of a platform and application market that allows installation and removal of available components, there is a dalvik virtual machine (DVM) so that it can run without having to consume large electricity, has graphics in 2D and 3D graphics based on open GL, has Sqlite, which is RDBMS software for data storage, supports multimedia such as audio, video and various image formats (MPEG4, H.264, MP3, AAC, AMR, JPG, PNG, GIF), supports GSM, CDMA, Bluetooth, EDGE, 3G, 4G, and wifi (HardwareDependent), there are also various sensors, such as cameras, GPS, compass, proxymity, fingerprint, accelerometer (depending on hardware).

2) Kinds of android based media

a) Google Classroom

Google Classroom is an application that allows the creation of classrooms in cyberspace. In addition, google classroom can be a means of distributing assignments, submitting assignments and even assessing submitted assignments. Thus, this application can help make it easier for teachers and students to carry out the learning process more deeply. Google classroom is actually designed to facilitate teacher and student interaction in cyberspace. Teachers have the flexibility of time to share scientific studies and provide independent assignments to students. In addition, the teacher can also open discussion spaces for students online.

Google Classroom is a suite of free productivity tools that includes Gmail, Drive, and Docs, and is available to users of Google Apps for Education. Google Classroom is designed to help teachers create and submit paperless assignments, including time-saving features such as the ability to automatically create a copy of Google Docs for each student. Google classrooms can also create drive folders for each assignment and for each student, to keep things organized. Students can track any assignments that are nearing their due date on the Assignments page, and get started with them with just one click. Teachers can quickly see who has not completed assignments, and provide input and grades directly in the google class room.

b) E-Book

So far, books have been a source of teaching material, a source of knowledge and literature that are believed by readers to be the best medium for carrying out the learning process. Along with the times, namely in the 20th century where the digital era developed very rapidly forcing book writers and publishers to produce new types of books that are different from conventional books that use paper as a writing medium, the book in question is a digital book that uses electronic media such as computers. and smartphones as writing media. This digital book is also called an e-book (electronic book).

E-book is an abbreviation of electronic book, which in Indonesian means electronic book / digital book. According to [7, p. 7] e-books, namely electronic books or digital books, are electronic versions of books. Electronic books have a smaller size when compared to conventional books. Most e-books have a search feature, so that words in e-books can be quickly searched and found. There are various popular eBook formats, including plain text, pdf, apk, jpeg, doclit and html. Each format has its own advantages and disadvantages, and also depends on the tools used to read the e-book.

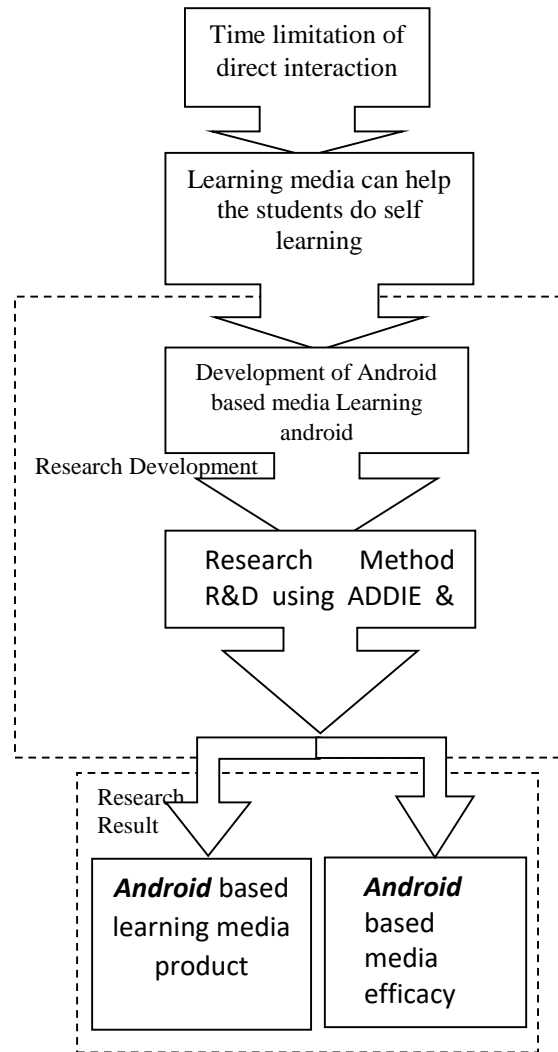
c) Quizizz

The development of technology makes it easier for us to do everything. Likewise in the field of education, technology will make it easier for teachers to carry out their duties in the classroom. Well, one example of using technology in learning is using interactive quizzes in class using an application, namely Quizizz.

Quizizz is a web tool for creating interactive quiz games for use in your classroom learning, for example for formative assessment. It is very easy to use, the interactive quiz that you create has up to 4 answer choices including the correct answer. You can also add an image to the question background and adjust the question settings to your liking. If your quiz is ready, you can share it with your students using the 5 digit code generated.

2. Framework

In research and development, a researcher must fulfill the procedure steps which are usually depicted in a plot drawing from start to finish. The general steps in research and development as a procedure carried out by researchers are as follows:



RESEARCH METHODS

This research uses research and development methods or Research and Development (R&D) research methods. The R&D cycle consists of studying research findings related to the product to be developed, developing the product based on the findings, testing it at the end user, and revising it to correct deficiencies found in the proposed testing stage. Thus, as the name implies, Research & Development (R&D) is understood as a research research activity and is continued with development.

Research activities are carried out to obtain information on user needs (needs assessment) through data collection and data analysis at the expert validation process stage and at the empirical validation stage or trial and error. Meanwhile, development refers to the products produced in research.

The development model used is the result of a combination of the 4D development model and the ADDIE development model. There are 4 stages carried out, namely; Needs analysis, design, development and evaluation.

RESULT AND DISCUSSION

1. Learning Media Development

This section describes the stages of research that has been carried out, where the development model used in this study uses a combination of the 4D development model which consists of 4 stages and the ADDIE development model which consists of 5 stages which are then modified into 4 stages, namely assessment and data collection (Analysis), Media planning (Design), Media development (Development), and final product evaluation.

The results of the development of learning media using android-based applications for multimedia learning courses can be used on the android smartphone to be used.

2. Validation of media experts and student trials

a. Efficacy of Learning Media according to First media expert

Media expert validation was carried out to assess 3 aspects, namely aspects of visual elements, aspects of verbal elements, and aspects of design. Based on the results of the assessment by the first media expert on the visual element aspect, the overall presentation score was 87.5% and was categorized as very good. The assessment consists of 3 indicators, then the verbal element aspect gets a percentage score of 84.1% and is categorized as very good, the assessment consists of 6 indicators. And the design aspect received a presentation score of 87.5% and was categorized as very good, the assessment consisted of 1 indicator. Overall, the percentage of the assessment was 86.4% and categorized as very good. So that the learning media for multimedia learning courses can be used. The results of the validation by the first media expert in graphic form are as follows:

b. Efficacy of Learning Media according to Second media expert

Media expert validation was carried out to assess 3 aspects, namely aspects of visual elements, aspects of verbal elements, and aspects of design. Based on the results of the first stage assessment of the visual element aspect, the overall percentage score was 87.5% and categorized as very good.

The assessment consists of 3 indicators. Furthermore, the verbal element aspect gets a presentation score of 88.6% and is categorized as very good, the assessment consists of 6 indicators. And the design aspect received a presentation score of 87.5% and was categorized as very good, the assessment consisted of 1 indicator. Overall, the percentage of the assessment is 87.9% and categorized as very good. So that the learning media for multimedia learning courses can be used. The results of the validation by the first media expert in graphic form are as follows:

c. Efficacy of Learning Media according to students

The trial stage was carried out in small group trials. The aspects that were assessed in the trial were aspects of the presentation of the material, the quality of

appearance, and the benefits. The results of the trials on students can be seen in the following descriptions:

The results of the small group trial in graphical form are as follows:

CONCLUSION AND SUGGESTIONS

1. Conclusion

Based on the research results that have been described, as well as seeing the problems from the problem formulation, the following conclusions can be drawn:

- a. The development of learning media in the Multimedia Learning course provides output in the form of Android-based learning media developed using the 4D development model and the one applied by researchers in this study consists of 3 stages, namely defining the needs of learning media (Define), designing learning media (Design) , development of learning media (Development), and evaluation of the final product of Android-based learning media that has been validated.
- b. The feasibility of learning media in the Multimedia Learning course that has been developed is declared "Very feasible" to be used in learning in the Department of Electronic Engineering Education, Faculty of Engineering, Makassar State University based on the results of the validation of teaching media conducted by media experts covering several aspects.

2. Suggestions

Based on the research results and conclusions, there are suggestions that can be given, namely for further researchers, as suggestions from the author to examine the effectiveness of the use of instructional media in the multimedia learning course class that has not been carried out by the author in this study.

ACKNOWLEDGEMENT

The author would like to thank the Chancellor and Chair of the Makassar State University Research and Community Service Institute for providing financial support through the Makassar State University DIPA in 2020.