



Design and Development of an Interactive Scouting Educational Game Using the MDLC Approach

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Abstract. This research aims to develop an Android-based educational game that can increase students' understanding of the concept of solving. The development method used is the Multimedia Development Life Cycle (MDLC) with a heuristic approach. This heuristic approach involves a user-oriented design process, prioritizing ease of use and compatibility with scouting materials. This game is designed with an attractive and interactive appearance, and is equipped with games that are tailored to students' abilities. The trial results show that this educational game is effective in increasing students' understanding of the concept of fractions. A part from that, students also gave positive responses to the use of games as a learning medium. This year's Scout extracurricular is indeed a non-compulsory extracurricular but schools are obliged to organize scout extracurricular activities, in the current digital era, learning media applications and educational games are really needed in schools from elementary school to high school. Therefore, this research aims to apply the basics of scouting by using articulate storyline 3 software as a learning medium for students and can be implemented during the activity.

Keywords: scouting educational game, MDLC, Articulate storyline 3, development of learning media

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1. Introduction

Scouting is a learning condition to form personality character, both physical, non-physical, social and emotional as individuals and members of society [1]. In carrying out scouting activities, children often feel bored to learn, because the learning process is too serious and monotonous such as coming directly, learning Morse code directly through teacher explanations, doing marching activities. This causes children's interest to decrease, the impact is that children become bored of practicing and often skip or ask permission to practice scouting, this certainly requires learning media [2]. One way to improve learning and knowledge for students about scouting can be through electronic media in the form of game applications. Through the media used in scouting extracurricular activities, especially the scout code for scout members, it is very important as a code for them in facing scout life and becoming a standard of scout behavior in the community. So that educational games become more interesting when played Extracurricular activities or extracurriculars are additional activities carried out outside of class hours which are carried out either at school or outside of school with the aim of gaining additional knowledge, skills and insights and helping to shape the character of students according to their respective interests and talents [3]. Based on the Decree of the Minister of Education and Culture No. 060/U/1993 and Number 080/U/1993, but in scouting activities many students feel less interested in participating in these extracurricular activities, and then scouting activities are specifically designed to suit the interests and talents of students. Meanwhile, according to the Minister of National Education of Indonesia No. 39 of 2008 concerning student development, extracurricular activities are a form of student development. This activity can be carried out inside or outside school to hone students' talents and interests so that students can enrich and expand themselves. or driving the development of students' potential to reach the maximum level. enriching and expanding the knowledge and abilities that students have from various fields of study [4]. The purpose of this study is where it will lead to the instructors and the board of directors being able to use the interactive media Articulate Storyline 3 in the learning process so that it can run in accordance with the sophistication of existing technology and can trigger the enthusiasm and motivation of students or students during the learning process [5]. This research method uses a literature review using a technique where there will be data collection - the data carried out is to search for several relevant sources, compare all sources, determine the right comparison, and build ideas from relevant studies. The results obtained from this study are that the use of Articulate Storyline 3 is very reliable as a container or tool that is a material in interactive teaching to support the learning process because it has various facilities that can encourage understanding and learning activities

Articulate Storyline is software that can be used to create presentations similar to Microsoft Power Points. Articulate Storyline can be said to be software that combines text, images, video, animation and sound so that it can provide an attractive form of visual presentation. The difference lies in the features in the software such as timeline, movie, picture, character and others. easy to use. Articulate storyline is called a multimedia authoring tool that functions to create interactive multimedia applications with content in the form of text, images, graphics, sound, video and even animation and simulation [6]. The results of the Articulate Storyline publication are in the form of web- based media (html5) or application files (.exe) which can be run on various devices such as laptops, tablets and smartphones. This application allows educators to realize their creativity to a higher level. Educators can also easily visualize the stories they are telling in storyline form. The following is an overview of the Articulate Storyline application [7].

The heuristic approach can be used to direct students in problem solving, so researchers use a module based on a heuristic approach to improve students' mathematical problem solving abilities[8]. The purpose of this study is to describe the development process, quality, and effectiveness of modules based on a heuristic approach [9]. The research subjects for the validity of the module are experts in the field of education, while for the practicality of the module are school students. Heuristics are generally interpreted as an art or mathematic science related to a new discovery or a solution to solve a problem [10]. In other sources, heuristics are defined as a way to show the thinking that someone has to be able to solve a problem so that it can be completed or finished immediately [11],[12].

2. Method

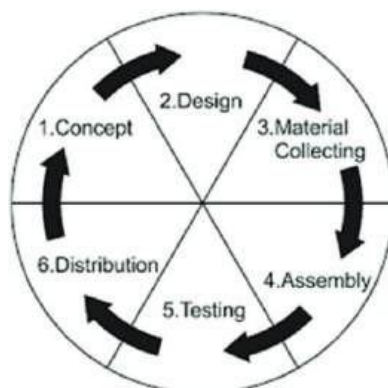


Figure 2. MDLC

The method used in this study is the Multimedia Development Life Cycle (MDLC) method, which is a Luther-Sutopo version model in [13] which is divided into 6 stages, namely concept, design, material collection, creation, testing, and distribution:

1. Concept
The concept stage is the initial stage of making an educational game. Where at this stage determines the goals and targets of the user. This has the aim of conveying basic scouting material to school students
2. Design
Design is the stage of designing an educational game that will be made using Articulate Storyline 3
3. Material collection
The material collection stage is the stage of collecting the necessary materials according to the needs that will be used by the educational game later.
4. Creation
The creation stage is the stage where all objects or materials such as materials are combined like design
5. Trial
The trial stage is a test of the assembled educational game to determine its success. Is it in accordance with the concept and objectives.
6. Distribution
At this stage, the educational game can be published or used for scouting learning media.

In this research the author conducted a literature study on articles found on the Google Scholar site, Research get and Journals that discuss learning media applications and its application to fields in real life as well as those discusses tools for creating media applications learning, a cognitive psychologist using likert scale, Likert scale is a measurement method that combines ordinal technique with intervals. In a Likert scale, respondents 38 respond to statements using sequential and structured scale. Likert scale is a method data collection that is most widely used in research in the form of a survey. The term Likert scale itself is more familiar with Rensis Likert, there are also those who call it Likert scale. In general, the Likert scale is a research scale intended to measure attitudes and opinions by means Respondents complete the questionnaire that has been given by the party researcher. Likert scale is a method of collecting research data, whether for qualitative research or research quantitative. Obtain data from a Likert scale in the form of opinions and attitudes of phenomena and perceptions. so this Likert scale is more appropriate used for research topics or themes that measure opinions, attitudes, and perceptions of respondents towards natural phenomena are happening[14].

3. Results and Discussion

Requirements analysis is a systematic process for identifying and understanding user needs related to system or software development.

- 1) Product Design

The design of the educational scouting mobile game application requires an interface design that can be understood by the user. The design created can display the structure of the mobile application starting from the design of the flowchart, storyboard, use case diagram, and activity diagram.



Figure 2. Product design

a. Flowchart

Flowchart is a stage or work process that is ongoing in the system as a whole. In addition, the system flowchart also describes the sequence of each procedure in the system.

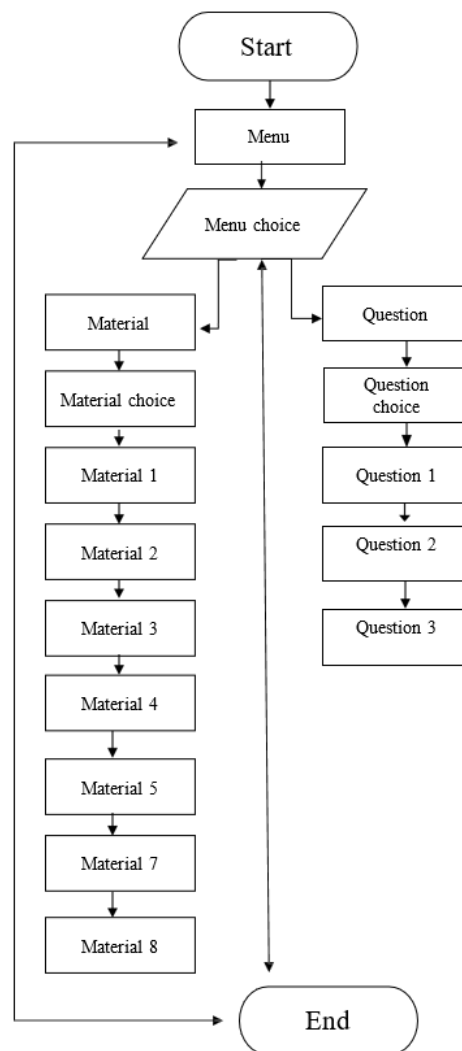


Figure 3. Flowchart

b. Storyboard

The storyboard design process provides an initial overview of the school environment introduction application. Where in the application there are several scenes that have a display. Where in this process a description of how the application will look later is made.

c. Use case diagram

A use case diagram is a modeling to describe the behavior of the system to be created. A use case diagram describes an interaction between one or more actors with the system to be created. With a quick understanding, a use case diagram is used to find out what functions are in a system and who has the right to use those functions.

d. Activity diagram

An activity diagram is a diagram that models the processes that occur in the system. This activity diagram will later describe the entire flow of the system from start to finish in detail and in a structured manner.

3.1. Assembly

The assembly/creation stage is the stage where all objects or materials such as materials are combined such as design, sound, background, buttons and images/other supporting materials using Articlane Storyline 3 software and also using website 2 apk builder software to change it to an Android application. Conclusions: Conclusions are sufficient to state the answers to the hypotheses and / or research objectives stated in the introduction. The conclusion does not contain a repeat of the results and discussion, but rather a summary of the findings as expected in the objectives or hypotheses. If necessary, at the end of the conclusion can also be written things that will be done related to further ideas from the research.

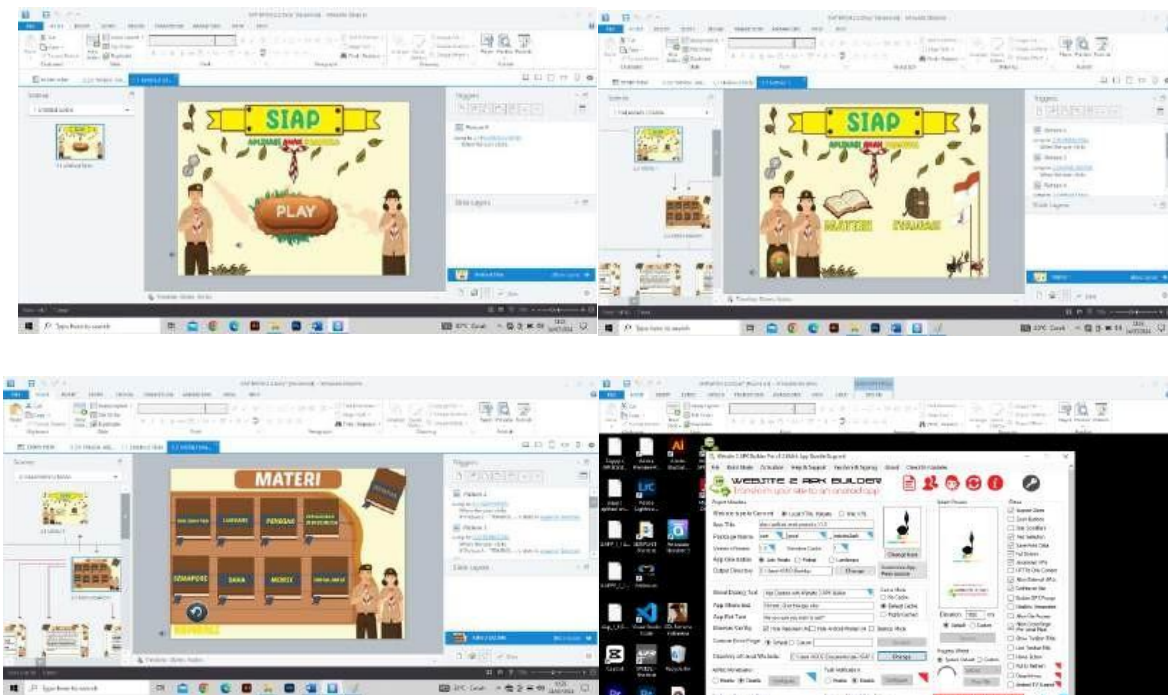


Figure 4. Assembly

3.2. Testing

In this study, researchers took data by conducting respondent tests on several aspects as a requirement for validating a product that could later be said to be suitable for use. Previously, researchers also conducted a literature study to find out information about the products that researchers made.

Table 2. Score of Material Testing

No	Name	Profession	Material testing
1	Validator 1	Teacher	90 point
2	Validator 2	Lecturer	100 point
3	Validator 3	Teacher	94 point
4	Validator 4	Lecturer	96 point

Based on the results of media expert validation and adjusted calculations using the Likert scale research method, the results refer to "Very Eligible" for testing.

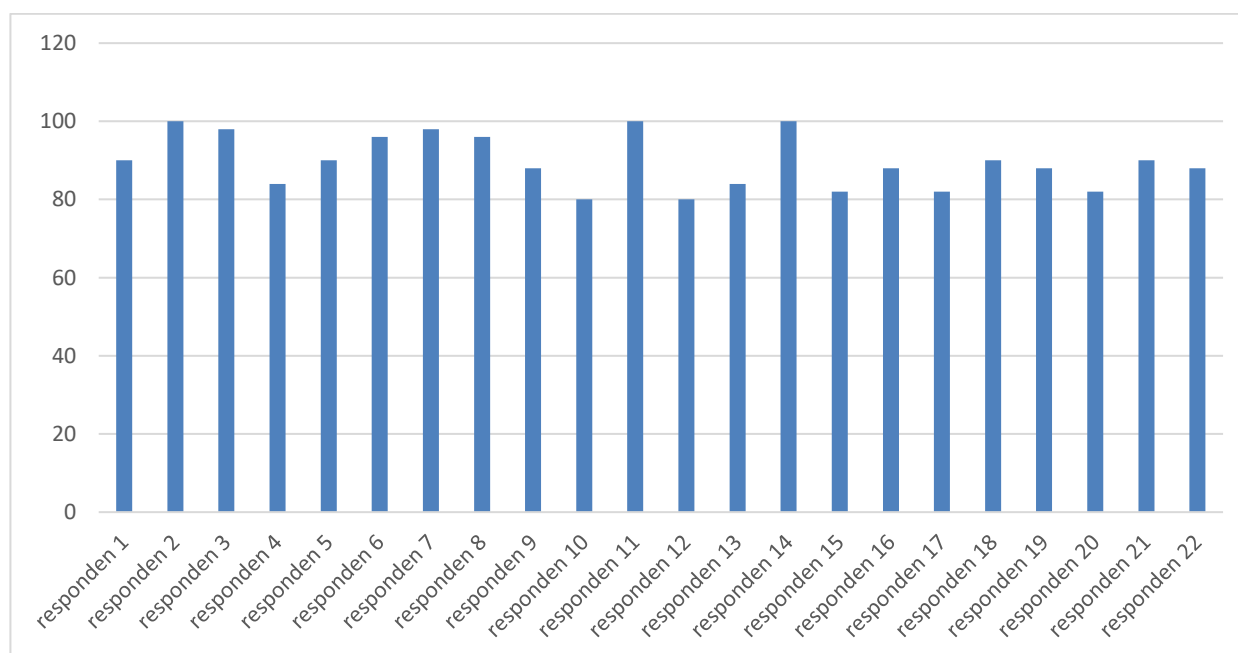


Figure 5. Respondent Score

Based on the respondents, the overall results obtained were 89.7% which can be classified as "Very Appropriate" using the Likert scale method.

The study used the Multimedia Development Life Circle (MDLC) model method which consists of six stages, namely concept, design, material collecting, assembly, testing and distribution. which consists of 6 stages, namely concept, design, material collection. The results of the respondent test showed positive results for scouting learning.

This is in accordance with the Development of Indonesian Game Technology "Pramuka Asik" Using Unity 2d Engine Based on Android which shows that 77.4% of respondents are satisfied with the Pramuka Asik Game application and the application can run and function according to the purpose of making this application, namely to introduce scouting activities to students or scout members in the form of a Game application on Android and hone the abilities of students or scout members in getting to know scouts [15]. Then this educational game can be used as one of the interesting and fun learning media, which can be

used anywhere but does not completely replace conventional learning media, then this educational game can present educational learning information about scouting science as a provision for forming personality character, both physical non-physical, social and emotional as individuals and members of society [16]. Then by using the Mobile Game Application for Scout Learning, it is able to help the scout learning process through gamification of scout activities with trail search games more fun and efficient [17], [18], [19], [20], [21].

4. Conclusion

Based on the assessment aspect of the scouting educational game product as an extracurricular scouting teaching material, the following conclusions were obtained Scouting educational game products have proven to be effective communication tools in presenting information about the basics of scouting. Students feel that the information provided through the scouting educational game is adequate and reliable, this is important because they are directly involved in the observation and data collection process. The clarity of information in the virtual to scouting educational game also helps students to understand basic scouting material anywhere and anytime.

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