Interactive Learning Media Arrange Animal Names Based on Android Game

Nur Khafidoh[1*], Ichwanda Ahmad Noviandy[2]
[1]Information System, Universitas KH. A. Wahab Hasbullah
[2]Informatics, Universitas KH. A. Wahab Hasbullah
*Email: nurkhafidhoh@unwaha.ac.id

ABSTRACT

The game is one of the important factors in the growth of children. Utilization and use of educational games can support the learning process of children. With the educational games, it is hoped that children's enthusiasm for learning will be more motivated. Educational games can create a pleasant atmosphere in the child's learning process. The images, music and sounds that appear make the child not feel bored, because the nature of the child likes to be bored when learning to use the written form. The making of the game "Arrange Animal Names" is designed with HTML5-based Construct 2. This game has a learning mode that will display several types of animals and their names when pressed. In this game there is also a play mode that will display pictures of animals and some letters that must be arranged correctly according to the name of the animal displayed. At the game creation stage there are several stages such as game design, menu design and character objects. So that the game "Arrange Animal Names" is produced that can be run on Android-based smartphones.

Keywords: Games, Education, Android.

INTRODUCTION

Quality education must be carried out from an early age. Along with the times, there are many facilities to support the implementation of education for children. All are affected by the development of increasingly sophisticated technology (Arifin & Achmadi, 2022). On average, at the age of 5 years and over, children have started to be able to read, they will tend to be interested in learning with fun pictures or writing, and at this stage children will be easier to remember an image or writing that has attractive colors and shapes.

In this study, the author will create an android educational game media that can be used for early childhood as another method of learning, with this interactive game media it is hoped that it will make children more happy to learn because it is made with an attractive and fun animated display (Ashoumi & Hariono, 2020). Based on the explanation above, in this final project the author will create an interactive learning media in the form of an educational game with the theme of compiling animal names with Construct 2 software, the results of which are exported to Android with the concept of learning while playing (Habibulloh & Sifaunajah, 2019). This educational game of compiling animal names is played by choosing the right letter by entering it into the space provided so that it will form an animal name that is displayed. In addition there is also a learning mode in this game, which displays pictures of several animals and the sound of the animal's name (Malik et al, 2018).

METHOD

This study uses the Luther–Sutopo version of the Multimedia Development Life Cycle (MDLC) method. This method consists of six stages, namely conceptualization, design, collection of materials, manufacture, testing, and distribution.
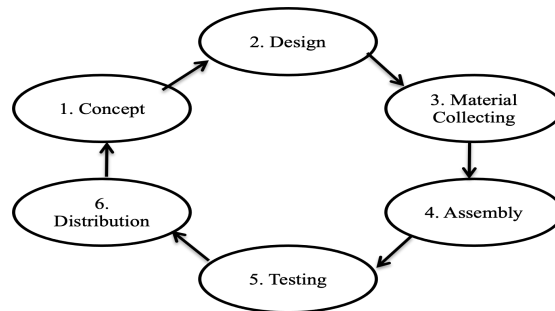
Figure 1 (MDLC method)

- **Concept**

The purpose of the game "Arrange Animal Names" is to help children in the learning process about recognizing animal names and compiling animal names based on Android, making it interesting to continue learning. The making of this educational game "Arrange Animal Names" is done by looking at tutorials from various references, namely books and the internet. Then it is used as a description of the application concept, which can be seen in table 1 below.

Table 1 (Application Concept)

Application	Description
Title	Educational Game "Arrange Animal Names"
User	Early Childhood
Feature	Pictures, sounds, learn animal names, compose animal names
Picture	Png format images, backgrounds, buttons, letters
Voice	Sound, game music in .ogg format
Interaction Button	Music button on off, developer info, learn, play, go back, restart, next and exit app

- Use Case Diagram

Use case diagrams are diagrams that describe the interaction between users and the application system. The function of the system is described by using a use case diagram. The following is the use case design for this application:
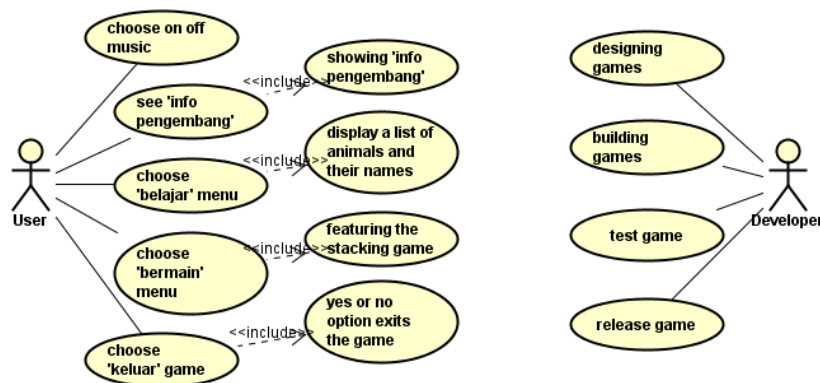

Figure 2 (Use Case Diagram)

- Activity Diagrams

Activity Diagrams describe the workflow or process activities of a system. The activity diagram in this application design can be seen in Figure 3:
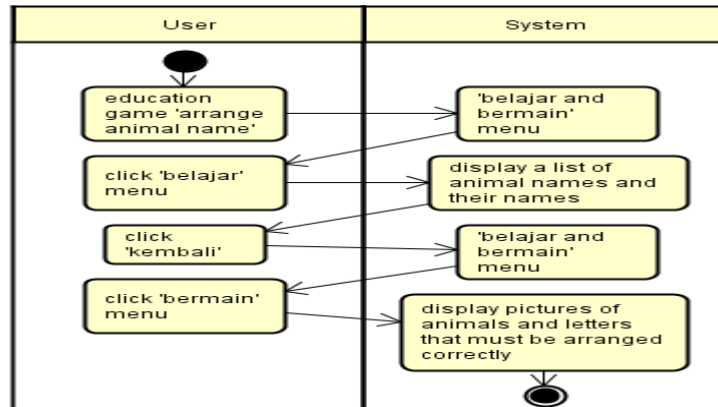
Figure 3 (Activity Diagram)

- **Design**
  - System view design
    The design of the navigation structure that describes the relationship between the menus in the "Arrange Animal Names" game applications is shown in Figure 4
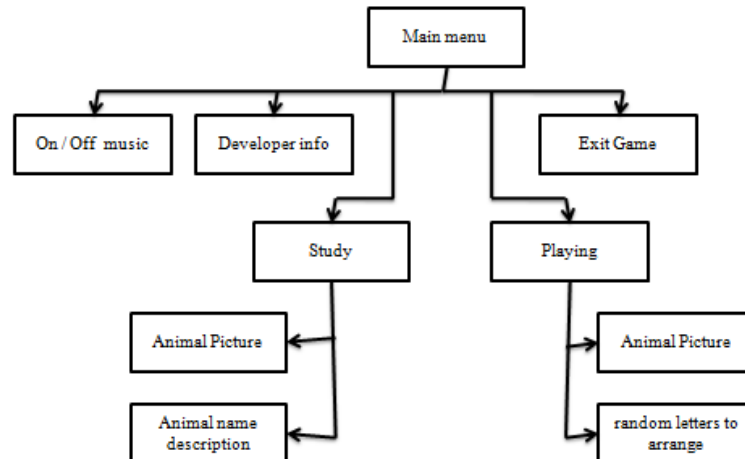

Figure 4 (navigation structure)

- Storyboard
  The design of the Story Board is the design of the interface or the interface of the application that is equipped with the specifications of each image, layer and text. The description of the educational game story board is shown in Figures 5,6,7.
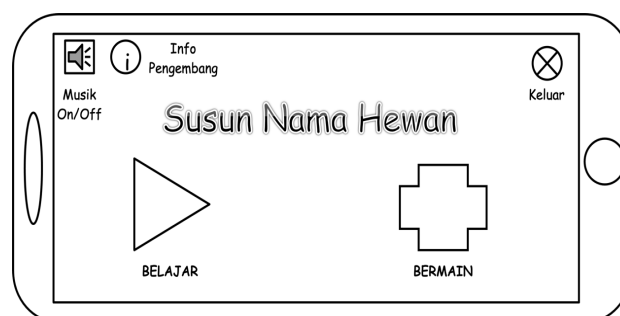
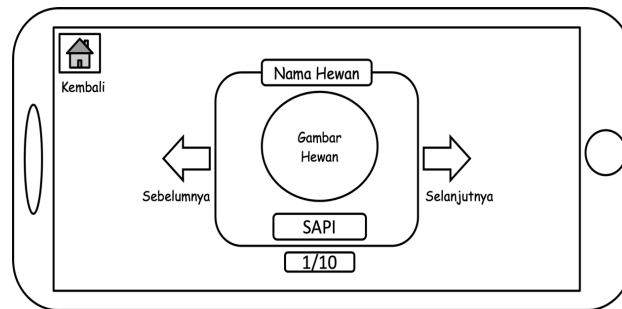

Figure 5 (Storyboard Main Menu)
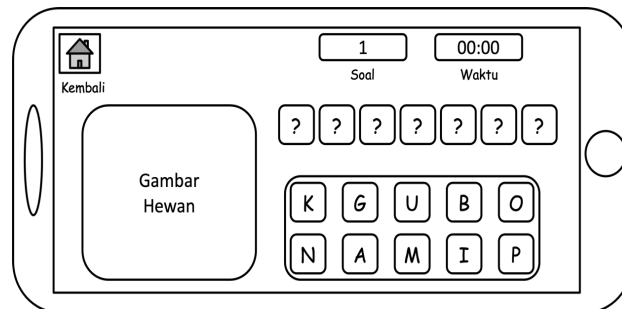
Figure 6 (Storyboard Learning Mode)

Figure 7 (Storyboard Play Mode)

- **Collecting Materials**

The asset materials for the educational game " Arrange Animal Names " in the form of image and audio files that will be used need to be collected first at this stage. The existing materials are not always ready-made materials, but there are also materials that must be made or edited as needed. Image assets are taken from the internet, namely on the *https://www.freepik.com/* site which provides many game assets both free and paid and through the editing process with image processing software, for audio assets by downloading via the internet on the *https://soundoftext.com/* and from Youtube.

- **Assembly**

Assembly is the stage of making from materials that have been collected based on the designs prepared at the design stage, namely based on storyboards and navigation structures. At this stage the materials that have been collected are then assembled using the Construct 2 application to become an educational game "Arrange Animal Names"

- **Testing**

Testing of games made using blackbox testing methods. The test is carried out to check the navigation buttons whether there are errors in giving orders or not and evaluate the results of the system that has been made.

RESULT AND DISCUSSION

This research has produced an educational game application "Arrange Animal Names" based on Android using Construct 2. This educational game "Arrange Animal Names" aims to introduce animal names through learning mode and are required to arrange letters correctly according to the animal images displayed in each question. .

- **Game Implementation**

The implementation of the educational game "Arrange Animal Names" based on system design and storyboards into the Construct2 tools is as follows:

- Implementation Results of Main Menu

The result of the implementation of the front menu page is an initial screen that displays the game title with motion animation and various buttons such as music on/off, developer info, learning mode, playing mode, and exit button.

Figure 8 (Implementation of main menu)

- Implementation Results of Music On/Off
    The implementation of the music on/off button is used to turn on or turn off the music in the game. If the music is on, the Music ON image is displayed, while if the music is off, the Music Off image is displayed.
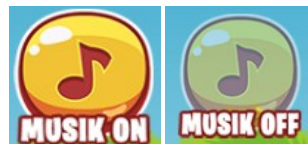

Figure 9 (implementation of Music On/Off)

- Implementation Result of Developer Info
    The result of implementing the developer info button is to display the educational game developer profile (Arrange Animal Names).

Figure 10 (Implementation of Developer Info)

- Implementation Results of Learning Mode
    The result of the implementation of the learning mode is a display of animal images with animated motions and sounds of animal names, also equipped with next and previous buttons to change the display of animal images, while the back button functions to return to the Main Menu.

Figure 11 (Implementation of Learning Mode)

- Implementation Result of Play Mode

  The result of the implementation of the learning mode is the display of animal images and random letters that must be arranged correctly according to the animal images in each question, the time to complete the arrangement of letters is 40 seconds. In this mode, if the letters are successfully arranged according to time, a success box image will be displayed with the options of return, repeat, and continue. Meanwhile, if you fail to arrange the letters according to time, the game over display is displayed.

Figure 12 (Implementation of Play Mode)

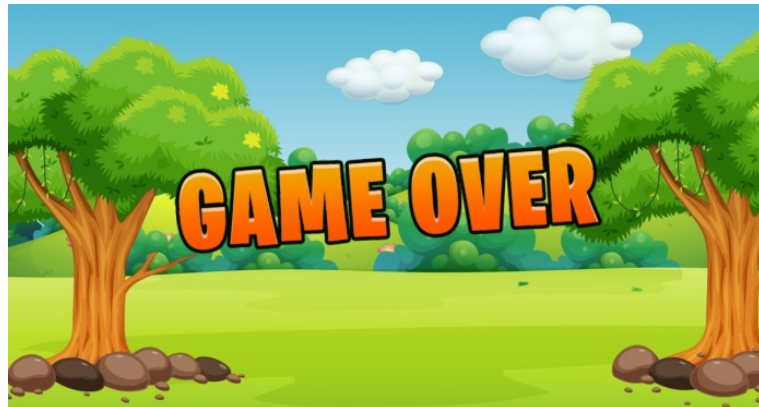**Figure 13** (Implementation of Play Mode (Succed))

Figure 14 (Implementation of Play Mode (Fail))

- Implementation Results of Exit Game
  The result of the implementation of exiting the game is the button used to exit the game, on the game exit screen the option is Yes or No.
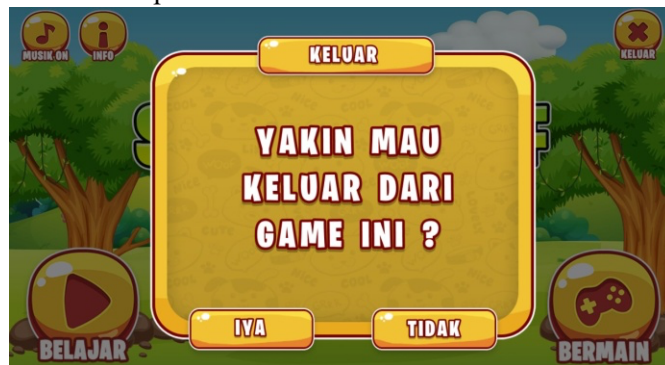

Figure 15 (Implementation of Exit Game)

- **Game Test Results**
  - Blackbox Testing
    Game testing is made using blackbox testing which focuses on checking the navigation buttons whether there are errors in giving orders or not and evaluating the results of the system that has been made.

Table 2 (Main Menu Blackbox Testing)

Function	Result
On/Off Music Button	OK
Developer Info Button	OK
Exit Game Button	OK
Learning Button	OK
Play Button	OK
Displays animal names according to animal pictures	OK

Table 3 (Learning Mode Blackbox Testing)

Function	Result
Back Button	OK
Next Button	OK
Previous Button	OK
Makes animal name sound when pressed	OK
Animal name voice dialing function	OK

Table 4 (Play Mode Blackbox Testing)

Function	Result
Back Button	OK
Change questions	OK
Countdown time	OK
The game display wins when the letters are arranged correctly	OK
Back button, repeat, continue in the game view win	OK
Game over display when time runs out	OK

CONCLUSIONS

Based on the discussion and testing on the research of making interactive learning media for animal names based on android games, the authors get the following conclusions:

- This study resulted in an educational game entitled "Arrange Animal Names" with a puzzle genre that can be played on Android-Based Smartphones.
- The educational game "Arrange Animal Names" is one of the effective learning media as a substitute for conventional learning media
- The educational game "Arrange Animal Names" has two game modes, namely play and learning modes which make it more interesting for children to use.
- Making this game using the Construct 2 application which is made in stages starting from the collection of game assets, namely images and sound. Image assets are taken from the internet, one of which is on the website *www.freepik.com*, and audio assets are made on the website *www.soundoftext.com*. After that, export it into an Android application.

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