Educational Game "Aoki and Friends" as Learning Media for Children in Animals Knowledge

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Article Information

Received: 15-11-2023
Revised: 30-11-2023
Published: 15-12-2023

Keywords
Educational; Games; Technology; Unity; Learning Media;

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Abstract

The purpose of this educational game is to teach players—especially kids—about animals. Learning games help increase kids' brain activity so they can answer problems more rapidly. Children can develop their sense of humanity, learn responsibility, and increase their emotional and social intelligence through identifying animals. The information utilized in this game comes from scientific sources as well as the author's own experience. The fundamental idea behind this game is that Aoki, a little child, is really curious about animals. Players of this instructive drag-and-drop game are instructed to select an animal, after which a description of the species will appear. The Game Development Life Cycle (GDLC) approach, which begins at the beginning and ends at the end, is used in this game design. beginning with the idea and concept development phase and ending with the game's release. Children between the ages of 4 and 9 are the target audience for this instructional game. Black box testing results from functional testing demonstrate that every game function works as intended.

1. Introduction

[1] First, the term "game" originates from the English word for "playing." In a broad sense, a game is an activity that is designed to be enjoyed by a group of people or by an individual. All ages, including children, teenagers, and even adults, are able to participate in games, which are structured games. Games can also sharpen brain activity, which can help one solve problems more rapidly. Despite the fact that playing games has a beneficial effect on the people who do so. On the other hand, this does not indicate that it does not have a detrimental effect. [2] The excitement and fun that comes from playing games has the potential to provide the basis for the development of game-like learning media that can be used to disseminate information in order to make people

more engaged in learning. [3] Games used as learning media can increase children's motivation to learn and can increase children's understanding of learning material by using a medium in the form of an interesting game. [4] With interactive learning media, a child can more easily understand the learning provided at the same time by playing. [5] Children will surely feel more confident when they engage with animals if given the opportunity to learn about animals. Interaction with animals has a lot of advantages; in addition to helping children develop a capacity for empathy, it can also help children develop their intelligence, particularly in theareas of emotional and social development. The ability to empathize with other living species is one of the ways in which youngsters can develop a feeling of humanity through the love they have for animals. All of that, however, must be done under the supervision of a parent. [6] It is possible to teach children how to feed animals, which will not only help them develop a greater feeling of responsibility but also help them develop a greater sense of compassionate care for animals. On the basis of the information presented above, an educational game will be developed with the intention of attracting youngsters to learn about animals and to comprehend it. With the way the game is designed, it is anticipated that youngsters will develop a greater love for animals, as well as a sense of duty and concern for other people.

1.1 Literature Review

[7] Knowing animals is one of the sub-themes in natural science subjects in elementary school. in addition, this lesson is also closely related to the living environment around us. With the existence of animal-themed educational games, it indirectly teaches children to be brave to interacting with animals and foster a sense of mutual love for living creatures.

[8] At this time, almost all schools in Indonesia are required to have smartphones for e-learning activities, one of which is Android. Android is an operating system for Linux-based mobile devices that includes an operating system, middleware and software. [9] In android not only has applications for learning or social media, but there are games too. by making educational games on android smartphones, is very interactuve, innovative as learning media where students are very interested and fun if they can play and learn at the same time.

[10] Educational game is a game with the aim of educating, where with this educational game can encourage children to think creatively. [11] Educational games are designed for learning with the aim of increasing children's interest in learning. Educational games must be educational, make players think, and have an attractive appearance. therefore educational games must be entertaining and contain education. By playing this educational game, the expected result is that children are more motivated to learn. In other aspects, children are also getting smarter at playing gadgets.

2. Research Methods

The research methodology that will be applied focuses on the application of the Game Development Life Cycle (GDLC) method, the following are the stages of research :

2.1 Research Stage

[12] This game design, designed in accordance with the phases in the GDLC (Game Development Life Cycle) method. Game Development Life Cycle (GDLC) is a method that develops games from start to finish. Starting from the stage of creating game ideas and concepts, while the final stage of the game is when it is released. The stages of the Game Development Life Cycle method can be seen in Figure 1.

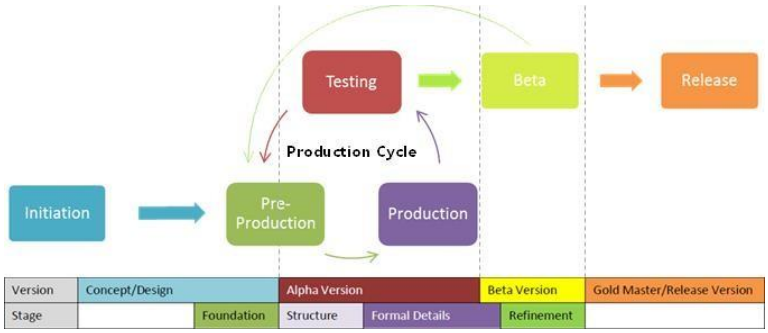

Fig 1. Game Development Life Cycle Methodology

The stages in the Game Development Life Cycle include:

1. Initiation

   In this research, the initialization stage is the stage of creating rough concept of the game to be created. This first step conceptualize the game in the form of a two-dimensional video game. In addition, the video game video game must also have an element of animal recognition. The name of this video game is Aoki and Friends.

2. Pre-production

   In the pre-production is a continued from the previous stage by making game prototypes. In this stage focuses more on the detail of game design. Such as determining the game genre is education and animals, then determining the gameplay applied is drag and drop. as well as compiling how player and game interactions by compiling game mechanics. An illustration of the system flow of the educational game "Aoki and Friends" can be found in Figure 2.

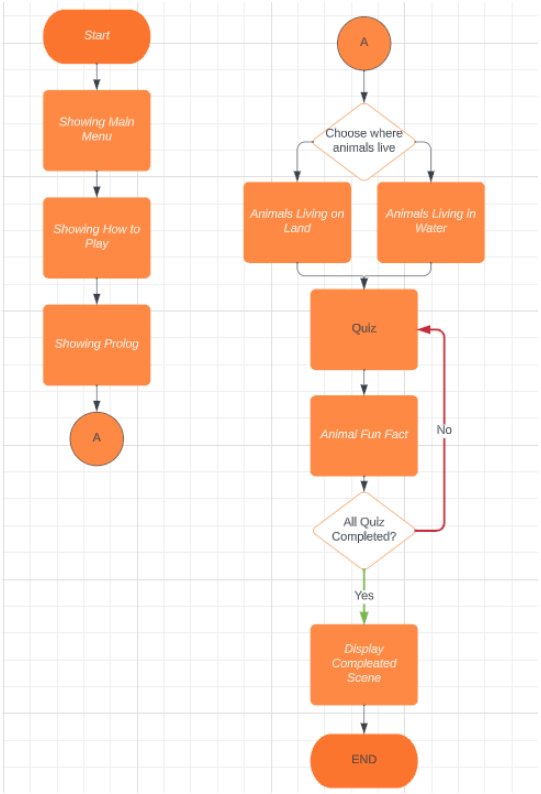

Fig 2. Flowchart Gameplay

During this stage, the process of creating characters, as depicted in figure 3, as well as composing the storyline in the form of storyboards, as depicted in figure 4, which are adapted to the tale in accordance with the storyboard, are also carried out. It is also during this pre-production stage that the quizzes that the players will be required to complete are designed. Not only that, but the game must also take into account the enjoyment factor in addition to the technical factors that need to be balanced in order to ensure that the game is not only playable but also enjoyable to play.

Fig 3 Desain Character

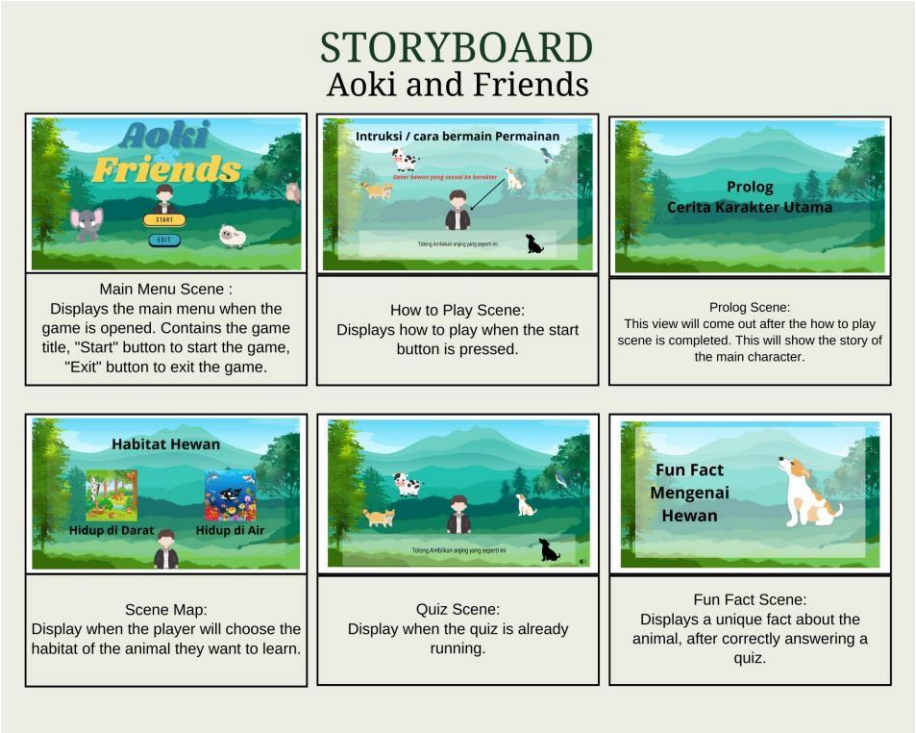

Fig 4 Storyboard Aoki and Friends

3. Production

The Production Stage is began to refine from the previous stage. at this stage of production began to combine assets into the game using unity game engine. The quality criteria at this stage are related to the

game needing to be fun and accessible. Additional features that are not yet available can be added at the production stage.

4. Testing

   The stage carried out in the trial is alpha testing or internal testing, testing is carried out with the aim of ensuring the functionality of the application runs well and runs according to the predetermined scenario. The testing method is done with the blackbox method. When testers find bugs, gaps, or dead ends during playtesting, they will be documented and analyzed. Then improvements will be made at the reproduction stage.

5. Beta

   Is a stage that is carried out after all the features in the trial have no errors and can be accepted by users or who use the application. Beta testing still uses the same method as the previous test. Testers are given more freedom to enjoy the game, because the purpose of beta testing is to get feedback on the game.

6. Release

   Is the final stage after testing the application as a whole and made in the form of application release. Release involves launching the product, documenting the project, and planning for game maintenance and expansion which will add new animals to the Aoki and Friends game.

2.2 Data Collection

This process will take data including field study data, making surveys to find out user interest, literature review and system development, the following explanation :

a) Field study is the stage of taking data by direct observation and interviews to users.
b) Creating a survey form with the aim of knowing the user's interest in the game genre to be played.
c) Literature review is taking data by taking literature with a minimum period of 4 years and a maximum of 9 years.
d) The Game-based application development method will apply the Game Development Life Cycle (GDLC) method.

3. Result and Discussion

Aoki and friends game describes a child named aoki who has a curiosity about animals. Players are expected to help Aoki to pick up animals in order to get to know about animals.

1. Main Menu Scene shown in figure 5. In this main menu scene displays two buttons play and exit. when the exit button is pressed, it will exit the game and if the main button is pressed, it will continue to the next scene.

Fig 5. Main Menu Scene

2. How to Play Scene shown in figure 6. In this how to play scene displays how to play, namely by dragging objects towards Aoki to complete the quiz. The next button will redirect to the next scene.

Fig 6 How to Play Scene

3. Prolog Scene shown in figure 7. This prologue scene tells about the main character in the game. The next button will redirect to the next scene.

Fig 7 Prolog Scene

4. Map Scene shown in figure 8. The player is encouraged to select the location where the animal they want to learn about lives on the scene map. The game "Aoki and Friends" allows players to choose between two types of species to coexist with: those that live on land and those that live in water.

Fig 8. Map Scene

5. Question Scene shown in figure 9. In this scene, players must pick the right animal based on the question. It will then show up that you know about animals.

Fig 9. Quiz Scene

6. Fun Fact Scene shown in figure 10. Knowledge about the animal will be displayed in fun fact scenarios. There is a sound feature in this scene. This tool is meant to provide voice explanations for children who are unable to read yet.

Fig 10. Fun Fact Scene

7. Quiz Completed Scene shown in figure 11. After all quizzes have been finished, this scene will display. The next button will take you to the next animal's home, while the home button will take the player back to the main menu.

Fig 11. Completed Scene

Blackbox Testing

The blackbox test results show whether or not the output results in each scene match the intended results. The main menu scene, quiz, fun fact, and completed scene are all tested. The results of black box testing are shown in Table 1.

Table 1. Black Box Test Results

No	Scenario	Expected results	Result
Main menu scene			
1	Enter the game	Main menu page display.	according to the expected results
2	Press the Mulai Button	Displays the next scene	according to the expected results
3	BGM and Animation	BGM and Animation is activate when enter scene.	according to the expected results
Quizzes scene			
4	Dragging an Object	When the object is the same as the question going to next scene	according to the expected results
5	Press the Pause Button	Displaying the Pause Scene	according to the expected results
6	Press the Back Button	Displays the previous scene, which is the map scene	according to the expected results
Fun Fact scene			
7	Press the Sound Button	Play the sound according to the correct quiz	according to the expected results
8	Press the Next Button	Displaying the Next Quiz	according to the expected results
9	Animation	Displays the animation when scene appear.	according to the expected results
Completed scene			
10	Sound Effect	Play the sound when scene appear.	according to the expected results
11	Press the Next Button	Displaying the Next scene which is sea animal scene.	according to the expected results
12	Press the Home Button	Displaying Main Menu Scene	according to the expected results
13	Animation	Displays the animation when scene appear.	according to the expected results

4. Conclusions

1. Finally, this design successfully implements the Game Development Life Cycle (GDLC) technique utilized in the development of Aoki and Friends educational game applications, which focuses on the stages/steps in creating learning game concepts.

2. This design leads in the creation of an aoki and friends animal introduction educational game software that may provide solutions for the introduction of animals to children and can be utilized by all groups who have an android-based smartphone for children aged 4 to 9.

3. This design creates educational games that may socialize animals in the community in the school and home environment in everyday life, and the aoki and friend game application is supposed to teach parents how to teach their children to love animals through this game.

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