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Designing English Education Game Application for Early Childhood

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A B S T R A C T S

This research aims to design a game app design that can help increase children's interest in learning English. The research method used descriptive qualitative by looking at early childhood learning during this pandemic, especially learning English, with additional data from literature studies. The system development method uses the waterfall method consisting of five stages: Requirement Analysis, Design, Implementation, Testing, Maintenance, and object approach method with tools such as use case, activity diagram, and interface design to produce an orderly system. The design of the game application is named GUTHEWORDS. It is expected to help increase children's interest in learning English to guess vocabulary such as animal names and numbers in English to help improve teaching success by making the teaching method fun and interesting for children. Through the implementation of learning through this game, it is expected to make it easier for children to learn to read, remember and hear some vocabulary in English well, also expected to explore the potential, creativity, and interest of children in learning English.

A R T I C L E   I N F O

1. INTRODUCTION

The Covid-19 pandemic has affected all aspects such as daily activities such as work and education around the world, without exception Indonesia (Aliyyah *et al.,* 2020). In Indonesia, March 2020 is the beginning of school activities, namely teaching and learning for two weeks carried out from home. Many parties have impacted, such as Teachers who have difficulty choosing a system for distance teaching and learning activities (Churiyah *et al.,* 2020). Through a circular of the Ministry of Education and Culture (Kemendikbud) of the Directorate of Higher Education No. 1 of 2020 about preventing the spread of Corona Virus Disease (Covid-19) in tertiary institutions. Through this circular the Ministry of Education and Culture gave instructions to universities to conduct distance learning and advised students to learn from their respective homes. To solve the problem, the plan is to create a learning concept with the form of games for early childhood, packed into a simple and easier method of games in absorbing fun new science in the hope that early childhood can be more spirited learning during this pandemic. Games are chosen as a system to help learning because children choose many games as entertainment media to eliminate saturation or just in filling leisure time. It is suitable as an education system for early childhood and a learning promotion material for children (Lucas, 2017). Education is a learning process to gain knowledge and improve someone's ability (Yunus *et al.,* 2015). From these two things, games and education can be created a learning system with educational games as the media. The definition of educational games is a fun activity that can be used as an educational tool. An educational game is a game that is designed as enrichment in supporting learning that contains material that will be delivered in learning designed in interactive games (Kristanto *et al.,* 2019). The educational game referred to here is a game for learning English at an early age because English is an important language to master. Also, it will be used during school because education in English is one of the most important lessons, such as the national examination as one of the graduation requirements for junior high and high school level. English is also essential to be mastered to keep up with the development of the era in globalization as this time, so teaching English for early childhood is necessary to provide sufficient knowledge to children.

In this educational game, several related studies have previously that designed an educational game for children aged 5-14 years about health that discusses the content contained in the diet, especially for people with diabetes (Calle-Bustos *et al.,* 2017). Other examples, such as Roxanner D. Hawkins et al (2019), designed an educational game show for children. The purpose of making this educational game is to provide knowledge and understanding to children about farm animals (Hawkins *et al.,* 2019). From 2 examples of previous research on educational games, it is known that providing learning and education and increasing knowledge for children can be done with unique and interesting media (Iida *et al.,* 2020).

Looking at the current research, the research was carried out to design an educational game application that can then be used as an option or alternative for children in learning, especially learning English called GUTHEWORDS. The teaching concept that is packed, interesting and fun is expected to make it easier for children to learn reading, memorizing, and listening to some English vocab. It will also attract children's potential and creativity. This designed system certainly still has many shortcomings for maximum use. Therefore the design of this system still needs a lot of improvement.

2. METHODS

2.1. Research Design

As a research procedure, the qualitative method produces descriptive data in the form of written or spoken words from people and observable behavior. So, the type of research used is descriptive qualitative by looking at the phenomenon that occurs today, namely how early childhood in learning during this pandemic, especially learning English with additional data from literature studies.

2.2. System Approach Methods and System Development Methods

To get the design of a system modeling, it is necessary to approach methods and develop the system to help the design process. This study used the method of approaching objects. The tools used to facilitate the analysis of a system, the devices in question, use case diagrams and activity diagrams. The method of system development used is by the waterfall method. In this method, there are five stages of development for the system that is being designed, namely Requirement Analysis, Design, Implementation, Testing, and Maintenance as shown in **Figure 1**.

## 3. RESULTS AND DISCUSSION

3.1. Requirement Analysis

The initial stage in the design of an application is used to analyze system needs such as data, information, models, and specifications of the system needed in an application design, both functional needs and non-functional needs. Functional needs are analyzed by modeling a system using tool use case diagrams and activity diagrams. While non-functional needs include hardware needs and software needs to support the application design process.
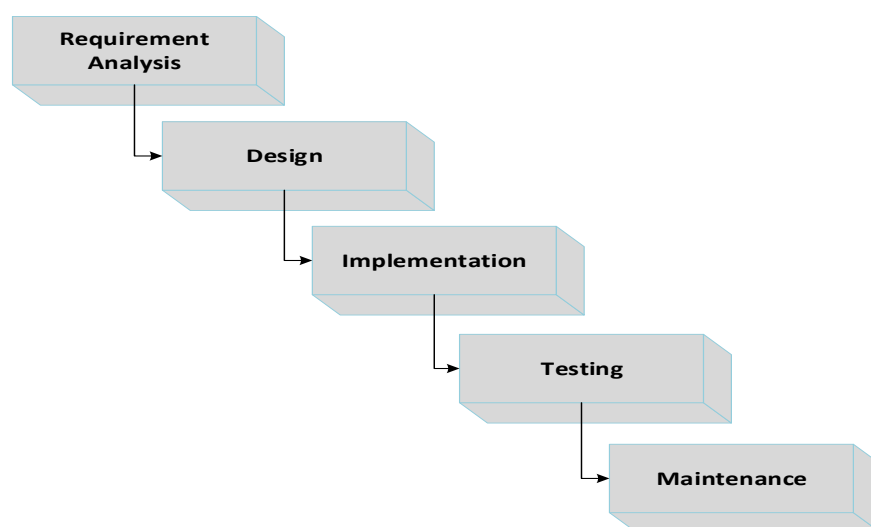

Figure 1. Waterfall diagram.

3.2. Design

At this stage is to create a system design from educational game applications. This design is created using the object approach method with modeling of use case diagram and activity diagram. Usecase diagram describes user interaction with the system to be created. The use case diagram of the proposed system is shown in **Figure 2**. Activity diagrams are an overview of the workflow steps or activities of a system. Below is an activity diagram of the proposed system as shown in **Figure 3**.
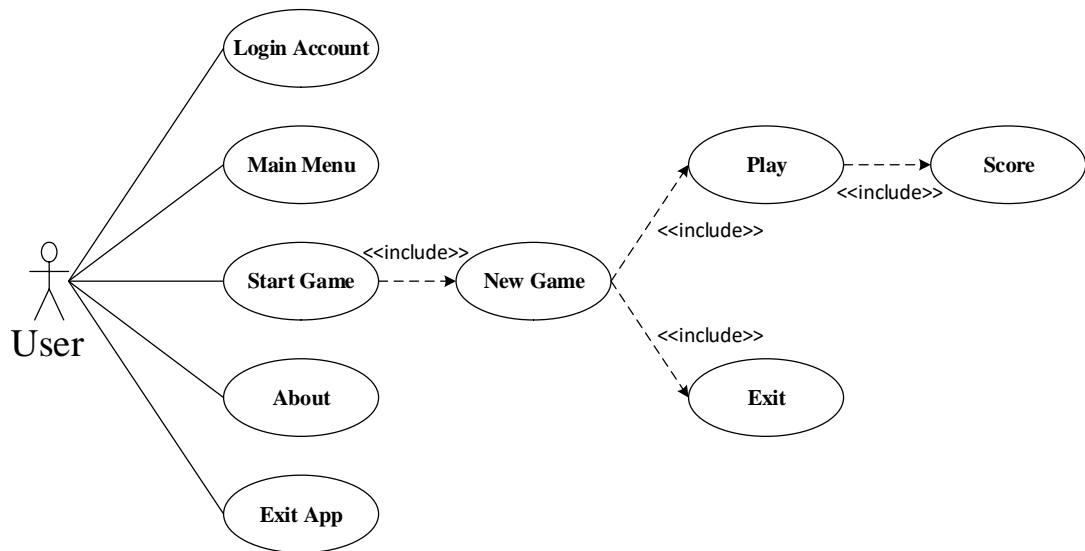
Figure 2. Use case diagrams of educational games.
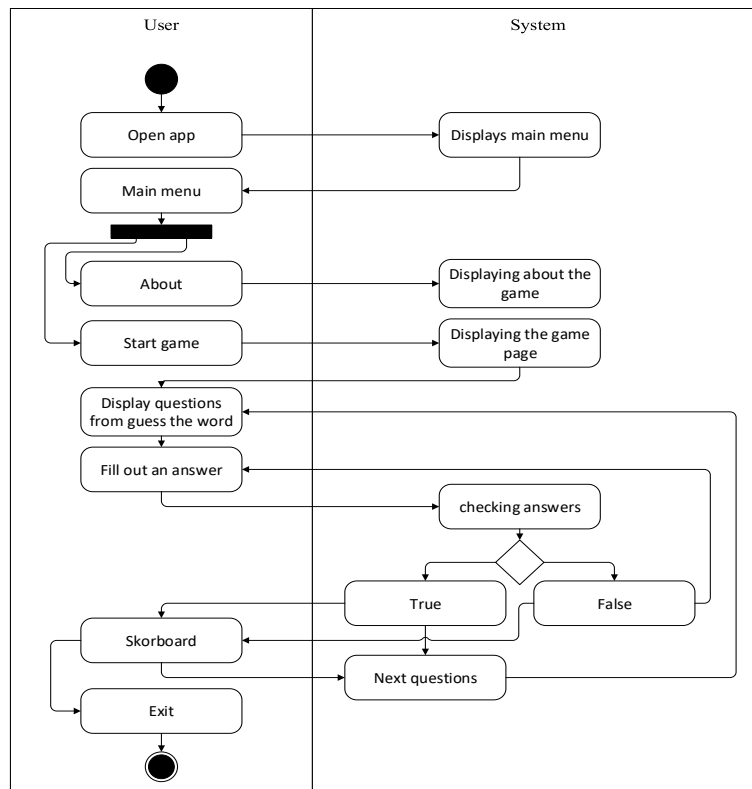
Figure 3. Activity diagrams of educational games.

3.3. Implementation

System development is carried out at this stage by creating applications using the selected programming language or coding.

(i) Initial View. **Figure 4** is the logo of the game. This view is an opener or scene loading when opening the application.

(ii) Create Account View. **Figure 5** is the create account view. This view is to create an account by filling in the data provided.

(iii) Main Menu View. **Figure 6** is the main menu view. In this view, there are several menus provided for the user to choose from.

(iv) Game Play View. In this view is the view when playing the game. There is an image to guess what The English language is and where to fill in the answer, **Figure 7** is the display when thinking the name of animals and **Figure 8** is guess the number.

(v) Correct or Wrong Answer View. This display is the result of the answer that has been filled in as shown in **Figure 9**, which shows the collection when the correct answer. When the answer is correct, it will get a score. **Figure 10** shows the look when the filled answer is wrong.

(vi) Grade History View. **Figure 11** is a view of the history of values that have been obtained.

(vii) About Game. **Figure 12** is the view from the about menu. Which in the menu about this there is information from this GUTHEWORDS game.

Figure 4. Display logo.

Figure 5. Create account view.

Figure 6. Main menu view.

Figure 9. Correct answer view.

Figure 7. Guess animal name view.

Figure 10. Wrong answer view.

Figure 8. Guess the numbers view.

Figure 11. Grade history view.

Figure 12. About game.

3.4. Testing

After application creation is the testing stage, the application that has been made is tested on the functionality aspect whether it is appropriate to the needs or not. Testing of this application is done by white box testing and black box testing.

3.5. Maintenance

This stage is the end of the development of the system on the waterfall method. Maintenance including the repair process if there are errors found on the system.

4. CONCLUSION

Based on the results, it can be concluded that games are not for entertainment alone, but games can also be developed for learning media. Guthewords game can be used as a means of entertainment and a means of learning, especially in learning English for early childhood. Games can provide different nuances for children in learning. It can also be used as an evaluation material for children because it can be used as a measuring tool of for children's English knowledge. Learning through this game is expected to facilitate children in learning English. It is also expected to explore the potential, creativity, and interest of children in learning English.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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