Implementation of the Decision Tree Algorithm as an English Learning Media at SD Negeri 1 Senenan

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ABSTRACT: This research is motivated by the declining interest of students in learning English because teaching the old or traditional way more or less hinders the ability of many students to understand certain languages. The purpose of this research is to design an English learning media in the form of educational games to attract students' interest in learning English further. This research uses the waterfall development method which is combined using the Decision Tree algorithm. In its application the *Waterfall* method has five stages, namely, Requirements Analysis, System Design, Program Code Writing, Testing, and Maintenance, while the application of the Decision Tree algorithm lies in the first game to choose what path or scan will each player get. The results of this study showed that 90.85% of people who took part in the survey through respondent questionnaires were interested in learning more English.

Keywords *:* Educational game, Decision tree Algorithm, English

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INTRODUCTION

Language has an important role in individual life, especially in early childhood. because language is a child's effort to express thoughts and feelings to others as opposed to speaking. Based on field results, children live in the 21st century where children must be required to compete internationally, so that it has an impact on children's language skills in the future, especially foreign languages. That one of the international languages that needs to be mastered is English. English is a language that is almost used in many countries of the world to communicate, so mastery of English needs to be considered for today's society to expand the information needed in the international world [1]. As a means of communication between global communities, English must be actively mastered both spoken and written. Given that English language skills are very important in the era of global competition, which is supported by technological advances [3]. Education must be able to bridge the good will between teachers or teachers and students in technological progress. This can lead to an innovation in utilizing media using smartphones or better known as mobile learning [4]. At SDN 1 Senenan the delivery of English learning still uses print media and conventional lessons so that students often feel bored with the lessons. By using the Decision Tree Algorithm is one of the algorithms that can be applied in the game. Researchers want to make an interactive English learning media application. The application of games as learning media or better known as Educational Games can give its own impression.

REVIEW OF LITERATURE

1. Educational Games

Educational game is a game designed and made specifically to be used as a learning medium through material that contains sound, text, images, animation, and video whose material discusses a particular subject, which aims to provide a better understanding and expand the concept of the material. which teaches a historical or cultural event conventionally or with print media, and can also teach users of this educational game well, because they can play while learning easily.[12]

2. Decision Tree

Decision Tree is one of the decision analysis techniques. Decision Tree itself was first published in the 1960s by Fredkin which comes from the word tries or digital tree, which is a retrieval or retrieval. Etymologically this word is pronounced as 'Tree'. Although it is similar to the use of the word 'try' but this aims to distinguish it from the general tree. Decision Tree is a tree structure, where each tree node represents an attribute that has been tested, each branch is a division of the test results, and a leaf node represents a particular class group. The highest node level of the Decision Tree is the root node, which is mostly an attribute that has the most influence on a particular class. In general, Decision Trees perform a top-down search strategy for solutions. During the process of

classifying unknown data, attribute values will be tested by finding or tracing the path from the root node (root) to the final node (leaf) and then predicting the class owned by a certain new data. In Decision Tree data processing there are 2 steps that must be applied 1. Changing the Form of the Data (Table) into a Data Tree Model 2. Changing the Tree into Rules (rules).[17]

3. Construct 2

Construct 2 is an HTML5-based game engine or tool developed by Scirra for the 2D platform.[15] The minimum requirements to run this application are Windows XP or later, 512 MB RAM, 1 GHz Processor, HTML5 compliant browser, and graphics card. In addition to being HTML5-based, Construct 2 can also create games for Wii U, iOS, Android, Windows 8 and RT, Windows Phone 8, Windows Desktop, Mac Desktop, Linux Desktop, Blackberry 10, Firefox Marketplace, Tizen, Facebook, Chrome Web Store, and Amazon. Appstore.[16]

4. Black Box Testing

This test focuses on the functional requirements of the software. This test allows RPL actors to obtain a series of input conditions that meet the functional requirements of a program.

METHODOLOGY

The research was developed using the waterfall method. The waterfall method was chosen because it uses a systematic and sequential approach in building software starting from the analysis, design, coding, testing and maintenance stages.[24] So that the existing stages must be done sequentially to minimize errors made.

The research method stage has 5 processes, the processes are:
1. Needs Analysis (analysis) This stage aims to understand, learn something and evaluate a form of problem that exists in the SDN 1 Senenan environment. This information can be obtained through direct observation, interviews, discussions or surveys in the field. After collecting the existing data, the researcher will present the main points of the problem.
2. System Design At this stage the researcher draws, plans and designs or arrangements from several separate displays in the Educational Game.
3. Writing Program Code At this stage the researcher applies the results of the design to the game maker software, where the researcher will enter the design along with the logic used to build an educational game.
4. Testing At this stage the researcher conducts testing of the development of a system which at this stage will be tested whether there are errors or not in the application. So that this application is feasible or not used by users.
5. Stages of Support (maintenance) This stage is the last stage of the Waterfall method. At this stage the finished educational game will be run and carried out maintenance, namely the process of repairing the system that is suitable for the user.

RESEARCH FINDINGS

The steps taken in completing this research are:
Design Stage
In designing this English Educational Game application, the researcher uses the system development method, namely Water Fall, which consists of 5 stages. The implementation of the entire procedure for developing this research in detail can be seen as follows:
1. Needs Analysis
This application is intended for fourth grade elementary school children who are studying English subjects. With this application, it will be a learning medium that will help teachers in teaching and learning activities because educational games will provide students with knowledge about English subjects, especially on the subject of further introduction of Pet's or pets.

2. System Design
a. depiction
The following is a description of the educational game application design:
The home page is the start page of the application which contains buttons, Play, Animal Information, About and Exit.

Figure 1. Home page

The play page is a game selection at the beginning. The player will play chapter 1 if the player gets a good score then chapter A will open (top), and if the player gets a good score then chapter B will open (bottom).
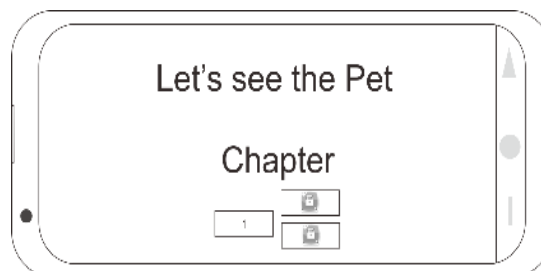
Figure 2. Menu All Games

Chapter 1 ayau game awal sendiri model permainannya adalah menebak nama hewan dalam bahasa inggris dengan media gambar.
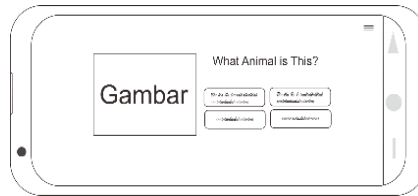

Figure 3. Chapter 1

Like the selection of chapters, players will be treated to scans A1 (Selec Level) and so on, but the difference here is that players will be able to buy characters to play educational games.
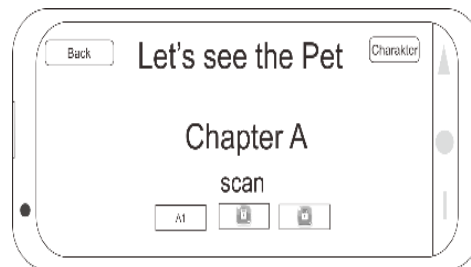

Figure 4. Chapter A

In-game descriptions, players will search for animals based on illustrations and pictures.

Figure 5. Chapter A . game model

In Chapter B, players will be treated to a guessing game, but not pictures but the characteristics of the animal.
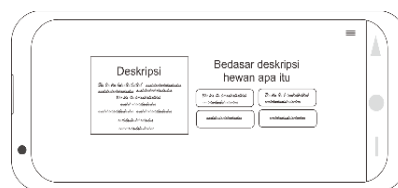

Figure 6. B . game model

In the animal information display, players can learn about the types of animals.
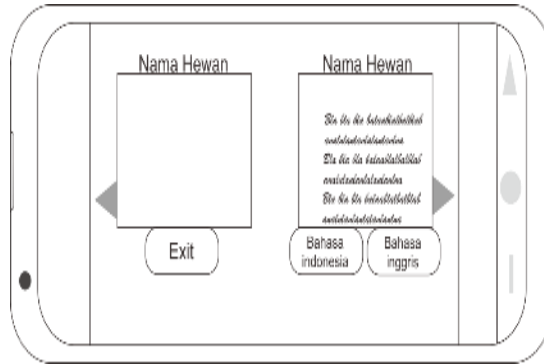
Figure 7. Animal Information Menu

3. Writing Program Code

At this stage, all components of the development of English educational game applications that have been prepared at the design stage are then assembled or combined into a single unit. This English educational game application is designed using Construct 2 software.

command code used to display the Home Menu.
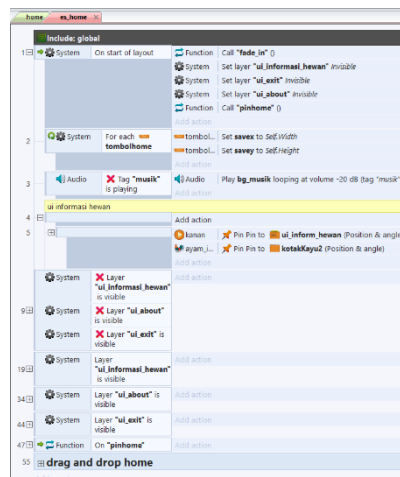

Figure 8. Display of Home Menu Code

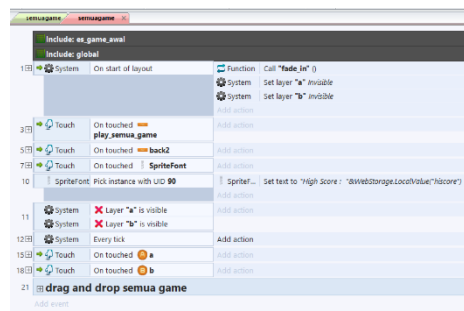The following is the command code used to display the All Games Menu.

Figure 9. Display Menu Code All Games

The following is the command code used to display the Early Game in the form of a guessing game for guessing animal pictures.
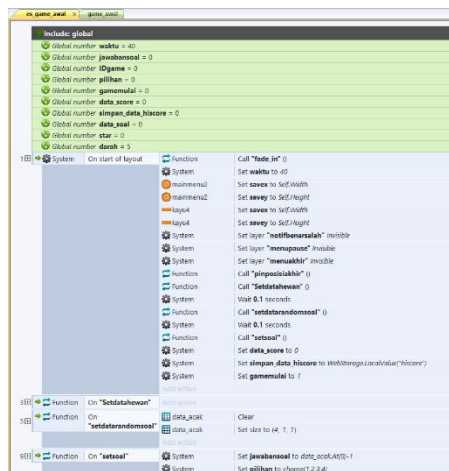

Figure 10. Display of the Initial Game Menu Code

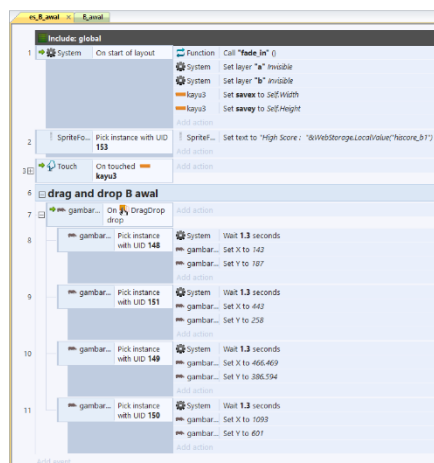The following is the command code used to display the Scan Menu Game B.

Figure 11. Scan Code Display Game Menu B

The following is the command code used to display In Game Scane B in the form of a game to guess the name of the animal based on the existing description.
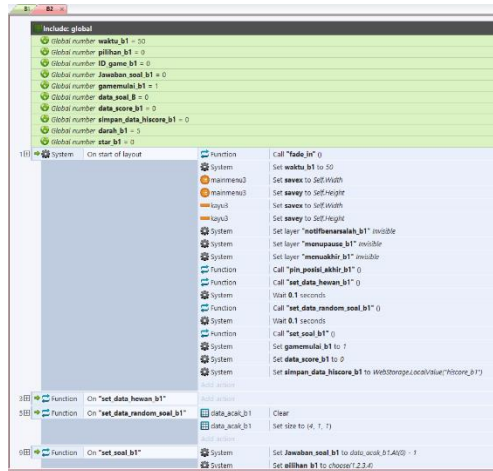
Figure 12. In-game Scan B code display

The following is the command code used to display the Selec Level which is used to select a level and buy Characters.
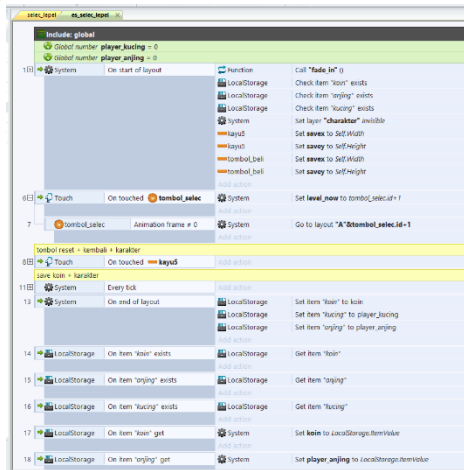

Figure 13. Display Code Selec Level

The following is the command code used to display In game Scane A in the form of a Platformer game.
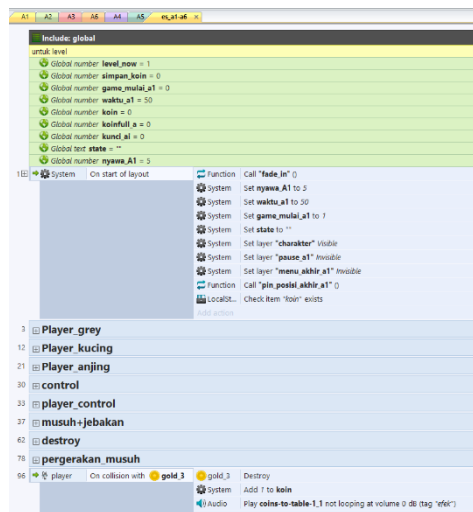

Figure 14. In Game Scan Code Display A

4. Testing

The test involves Media Experts, Material Experts and 40 respondents so that this application is feasible or not to be used by users.

5. Maintenence

This stage is the last stage of the Waterfall method. At this stage the finished educational game will be run and carried out maintenance, namely the process of repairing or adding a system that is suitable for the user.

DISCUSSION

The implementation of Game Application

1. Display the English Educational Game Application Icon after it is installed on the smartphone.
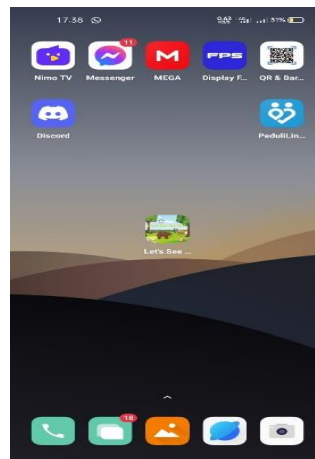

Figure 15. Icon

2. This splash screen display displays an illustrated image of the application for a few seconds before entering the application.

Figure 16. Splash Screen Tampilan

3. The Home screen displays the menu options available in the application. In the main menu displays the Animal Information menu, Play, Exit, and About.
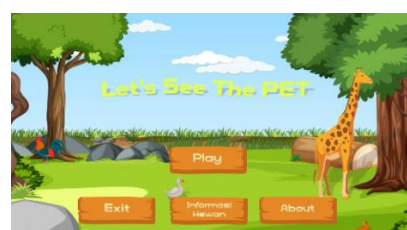
Figure 17. Home Display

4. Animal Information Display displays the material contained in this Bajasa English educational game application, namely Animal Pictures, and Animal Characteristics that can be changed from English (originally) to Indonesian (after changes).

Figure 18. Animal Information Display

5. The All Games menu displays all existing games starting from the initial game, Scane B (if the Player or player scores less than 70) and Scane A (If the Player or player scores more than equal to 70).

Figure 19. Display menu All games

6. The initial game display shows a game of guessing animal names with pictures in English (Score in this game will be a reference to get or open Scane A or Scane B).

Figure 20. Initial Game Display

7. The Scane B menu display displays the prefix or Home for Scane B.

Figure 21. Display Menu Scan B

8. Display In Game Sacne B displays a game to guess the name of the animal with the characteristics of the animal in English.

Figure 22. In-game Scan B . display

9. The Selec Level display displays the Scane A menu which is used to select the level and purchase the characters in the Scane A game.

Figure 23. Display Selec Level

10. In Game Sacne A display shows Platformer or adventure games where the player or players will look for animals with the characteristics that are displayed.
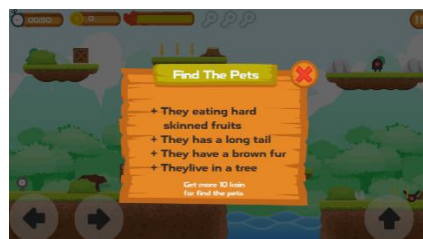

Figure 24. In Game Scan A . Display

Application Testing:
1. Algorithm testing

This Scane selection system uses a Decision Tree as a method that will classify existing data. These data include gender, preferred language, score, scan.

2. Training Data

Table 1. Training Data

Name	Gender	Preferred Language	Score	Scane
Rava	Male	Indonesian	Medium	b
Kaiza	Perempuan	English	High	a
Valen	Male	Indonesian	Low	b
Dilla	Perempuan	English	Medium	a
Laras	Perempuan	Indonesian	Low	b
Bayu	Male	English	Medium	b
Gendis	Perempuan	English	Medium	a
Kiki	Male	Indonesian	High	a

After going through the calculations, it can be concluded that the highest hierarchy is held by the score and the following is the course of the Decision tree in the game:
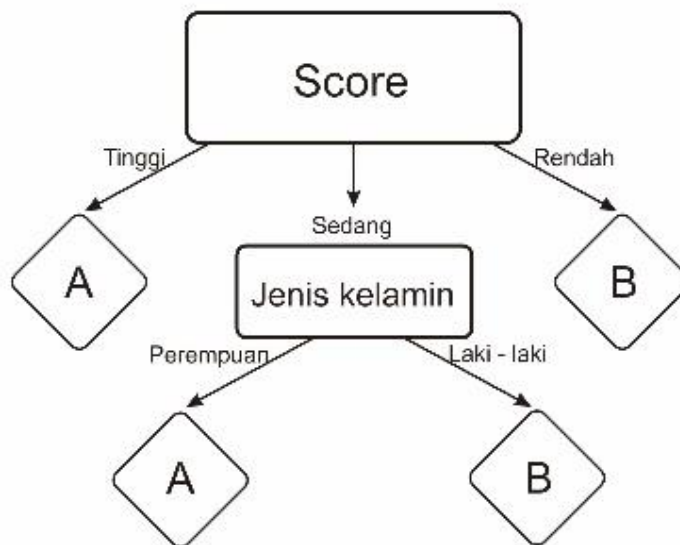

Figure 25. Result of branching

1. If the player has a High Score, gender is male or female, who likes English or likes Indonesian, they will enter Scan A.

2. If the player has a Medium Score, female gender, who likes English, they will enter Scan A.
3. If the player has a Medium Score, gender is male or female, who likes English or Indonesian, they will enter Scan B.
4. If the player has a Low Score, gender is male or female, who likes English or Indonesian, they will enter Scan B.

Table 2. Algorithm test results

| No. | Input | | | Output | |
	Score	Gender	Preferred Language	Scane	Description
1.	High	L	English	A	In accordance
2.	High	P	Indonesian	A	In accordance
3	Low	P	English	B	In accordance
4.	Medium	P	Indonesian	A	In accordance
5.	Medium	L	English	B	In accordance
6.	Medium	L	Indonesian	B	In accordance

Black Box Test

Black Box Testing is carried out to check the feasibility as a quality assurance process at the implementation stage based on the functional table. From the test results obtained a 100% validity level so that the game meets all test scenarios with expert validation.

The feasibility of the let's see the pets application has been tested and assessed by 2 material experts and 2 media experts and the questionnaire was distributed to 40 people with the following results:

Table 3. Expert Validation

No	Examiner	Name of Examiner	Score	Criteria
1.	Media Expert	1. Muhammad Husen, S. Kom 2. Ellenia Kotinda, S.Kom	91,6%	Very Worthy
2.	Material Expert	1. Faiz Tri Pujiono 2. Innocento Dyah N S.pd	95,8%	Very Worthy
3	Public	40 Responden	90,85%	Very Worthy

Berdasarkan tabel hasil pengujian dapat disimpulkan bahwa untuk ahli media mencapai 91,6% dan berkriteria sangat baik, responden ahli materi / guru pengampu 95,8% dan berkriteria sangat baik serta responden masyarakat / wali peserta didik 90,85% yang menghasilkan kesimpulan sangat layak sehingga aplikasi dapat digunakan oleh SDN 1 Senenan untuk digunakan dalam pembelajaran.

Based on the table of test results, it can be concluded that for media experts it reached 91.6% and had very good criteria, 95.8% material expert respondents /

tutors had very good criteria and community respondents / guardians of students 90.85% which in a very feasible conclusion. so that the application can be used by SDN 1 Senenan for use in learning.

CONCLUSION AND RECOMENDATION

After the process of developing English educational game technology was used as a learning medium, which was named "Let's See The Pet" by the researchers, it was concluded that this application could make it easier for students to understand and increase students' interest in learning English subjects. This application is also equipped with appropriate audio, and there is game material that has been adapted to the existing lessons. With 92% of people stating that the English Educational Game application can attract interest to learn more English in accordance with the purpose of this application.

ADVANCED RESERACH

This research is still far from perfect, so the researcher gives suggestions for further research, namely: using more data sets so that the prediction accuracy becomes more accurate and the graphic display in the game can be further beautified to further increase the attractiveness of children to learn while playing games.

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