

Development of Learning Games "Finding Animal" to Support Learning Activities of Animal Recognition in Early Childhood Education

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Abstract. The development of computer graphics today requires developers of computer graphics application systems to be able to develop information that is equipped with visualization and animation, so that it can be more easily understood by those who use the system. This causes many IT-based products to emerge, one of these IT products is Unity3D. Unity3D is an integrated tool for creating games, building architecture and simulation. Using Unity3D programs can be made with more tangible results. The use of computer graphics has long been used in several types of applications, one of them in the field of education. Lack of interest in learning at an early age can affect the quality of education in children aged 4-5 years. Learning model adapted to the age of play is one factor to increase the interest of children in learning. In this study, developed natural objects of animals using Unity3D which if the pointer is directed to an animal object will show information about the animal, so this application also has educational value for its users.

Keywords: *learning, game, childhood*

I. INTRODUCTION

The use of simulation programs in the world of education is increasingly popular among the public, especially among children. According to Sudarmilah, et al (2012), the advantage of a simulation program at this time is that it can be used as a learning media that is fun and easy to use. Many types of simulation programs can be used to support children's learning processes, one of which is simulation of animals. This simulation aims to teach about education such as recognizing animal shapes, animal names, studying animal characteristics, where the animals live, and more. [1]

Previously there has been a lot of research (literature review) that was carried out regarding discussions about simulation programs used in the world of education. When compared with conventional learning methods, learning using simulation programs is superior in several

aspects. One of them is Santoso, et al (2017) [2] which states that a significant advantage of educational games is that there is animation that can improve memory so that children can store subject matter for a longer time than conventional teaching methods. To create a quality generation, education must be done from an early age in this case through Early Childhood Education (PAUD). In PAUD, children have been taught how to learn with playing media. [3] With this background, we try to create a simulation program to optimize the children's learning process to get to know animals. This program can be used as an alternative media for PAUD teacher learning in transforming conventional learning methods into learning ways to use simulations, so as to develop children's creativity, because in learning with simulation it has elements of accuracy, reasoning and ethics.

In making this application researchers developed an interactive game called "Animal123". The name "Animal123" has the philosophy that Animal is English from animals, and 123 is the initial numbers in numerical order, illustrating that when using the game application, PAUD students are in a period of basic introduction to animals. The development of the game is done using Unity3D which includes Microsoft Visual Studio Community 2017 as a tool. The programming language used is C# (C-sharp). The results of this application can be useful for learning animal recognition in PAUD.

In the research conducted by Nurchasanah (2016), the development of multiplatform games for PAUD benefits in the range of 88-97%. Meanwhile, Nurkholis (2015) in his research stated that educational games for animal name recognition in English for elementary school students had success rates in appropriate categories to be used in learning.

II. LITERATURE REVIEW

According to Lam [4], mobile games are games that can not only be played through cellular phones, but can be developed on a variety of mobile handsets such as PDAs,

Symbian OS and Microsoft's Smartphones. Mobile games are played using technology that is inside the tool itself, for example game software that already exists in the cellular phone itself. For games that are played online, there are several technologies commonly used, for example by text messaging (SMS), multimedia messages (MMS) or GPRS to identify the location of the Game can be of several types. This type of mobile game is usually called the game genre. The format of a game can be purely a genre or can be a hybrid from several other genres. This is not wrong in making a game. We can combine several genres into a game to make the elements of the game more varied and challenging (Henry 2010: 112). According to Henry there are types of games like the following: (1) gambling; (2) adventure; (3) action; (4) racing; (5) fighting; (6) simulation; (7) RPG; (8) sport; and (9) strategy.

Game Gambling or game betting of money or something of value material on an event with uncertain results with the main goal of winning extra money or material goods. Adventure game [4] is an adventure game genre. Along the way the player will find equipment to be stored and useful as a travel guide. Game Action is a genre of video games that emphasizes physical challenges, including hand-eye coordination and time-reaction. Genres include various subgenres such as fighting games, shooter games, and platform games, which are widely regarded as action games. Racing game with the theme of speed competition. Each participant in a racing competition strives to pass a certain distance and distance, with the fastest time in one arena of competition. This fighting game requires players to be agile, responsive, good response. Simulation games can be called the most difficult type of game, both the algorithm for making it and its animation. RPG (Role Playing Game) type of game that controls only one character or can be more, in completing various missions through the adventures that he lived. The adventure is accompanied by battles and gaining experience. This sport game has a sports theme. The game that presents the sports genre is called sport game. This game is the same as the edutainment genre. The game strategy players make moves after other players make a move.

III. METHOD

The method used in this study is the development research method. According to Sugiyono (2010), the method of research and development is a research method that focuses on the work of certain products and testing the effectiveness of these products. Development research is an activity of collecting, processing, analyzing and presenting data carried out systematically and objectively accompanied by activities to develop or produce a product and test the effectiveness of existing products to solve a problem at hand. This research requires primary equipment and supporting equipment for designing, manufacturing and implementing educational games. The equipment used is in the form of hardware and software as follows: Hardware 1). Intel Core i5 processor; 2) AMD Radeon HD 7600M 3 VGA). 500 GB hard drive; 4) 4 GB DDR3 Memory RAM while at the Software angle: 1)

Unity 3D 2018.1.0f2; 2) Microsoft Visual Studio Community 2017. The material used in this educational game is data about animals. In making this application the author conducted an internet survey. The object of research that is the research of this game application is that early childhood in PAUD namely Playgroup (KB) and Kindergarten (TK) are aged from 3 to 6 years. The Flow Chart can be seen in Figure 1.

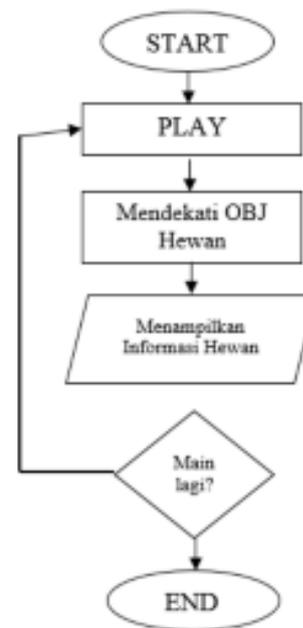


Figure 1. Program flow chart

This game uses characters that function to support the game's display. The character used is OBJ tiger and horse animals obtained from the internet. In this game, players are not imaged because the concept of this game is a first-person shooter (FPS). When a player approaches an animal object, the writing will appear above the object. The article contains information about the animal. When the player moves away from the object, the writing will disappear. Whereas when approaching other animal objects, information will appear according to the approached animal. [5]

The atmosphere in the game (in game) is designed to follow the actual state of the landscape, according to the habitat of animals that are modeled. Terrain that is made adjusts like the temperate wilderness of the savanna with uneven or flat land, hills, weeds and trees that are not too often.

B. The ease of learning material

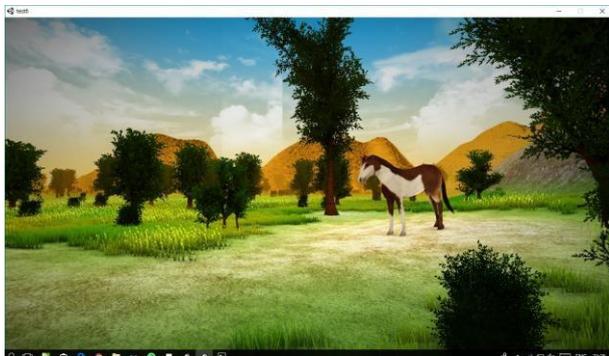
Learning to use simulation programs can attract the attention and interest of children so that students can focus on the material presented, and make it easy to understand the material because of its interactive presentation. With a combination of various media elements consisting of text, graphics, photos, videos, and sounds that are presented interactively in learning media children are expected to learn with an atmosphere that does not make them bored.

C. Ease in presenting material in real

The simulation program created with Unity3D software uses 3D-based media, so it can make users seem to be able to see real from the surrounding environment. The contents of the material presented are in accordance with the Basic Competencies that must be achieved by PAUD students towards the introduction of the surrounding environment. The quality of images, animations, music, and sound effects are well presented and integrated with each other.

IV. RESULTS AND DISCUSSION

The initial appearance of the program is as follows. In pictures 2 to 7, grass and trees are designed to be able to follow the swaying by the wind.



In the program, when the program starts it is not preceded by a menu so that it directly enters the main gameplay. However, this can also spur learners to explore "What should I do?". When students are accustomed to playing games on a desktop (PC game), students will quickly understand that the way to do it is to use the W, A, S, D, and so on. When students do not know how to run it, the teacher will be the facilitator in directing students to which buttons will be pressed. It can be concluded that this program facilitates students who experience slow learning, normal, and who learn faster than their friends. This application can be run on a Windows operating system, at least Windows 7 with VGA at least an Intel VGA 3000M Series. RAM memory used is a minimum of 2 GB, and a 500 GB hard disk.

When played, the atmosphere in the game (in game) [6] is designed according to the actual conditions of the

landscape which is the habitat of the animals used as the model. Terrain that is made is conditioned as a savanna in the presence of land that is not too flat, windy hills, weeds, and trees that are not too dominating (not jungle tropical forests).

When players approach one of the animal objects, a text will appear containing information about the animal (name, latin name, place of life, habits, etc.) above the object. When the player moves away from the object, the writing will disappear. Whereas when approaching other animal objects, information will appear according to the approached animal.

V. CONCLUSIONS

An educational game that was developed that serves to introduce animals. Learning that uses the educational game is carried out in PAUD, namely at the KB and TK levels. This program facilitates students who experience slow learning, normal, and who learn faster than their friends. This application can be run on a Windows operating system, at least Windows 7 with VGA at least an Intel VGA 3000M Series. RAM memory used is a minimum of 2 GB, and a 500 GB hard disk.

When played, the atmosphere in the game (in game) is designed in accordance with the actual conditions on the landscape which is the habitat of the animals used as the model. When players approach one of the animal objects, a text will appear containing information about the animal (name, latin name, place of life, habits, etc.) above the object. Conversely, when players stay away, the writing will disappear. The next development for this application is to add a home screen that is like Play, Settings, About, and Exit to further enhance the application. Besides that, it also needs to be held more and more complex about the appearance of text objects, so that they are easier to read by children, especially those who have just been introduced to computers. Next is the addition of the Exit, Exit, or Pause button in the game so that when it comes out it can be easily without having to click Alt + F4.

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