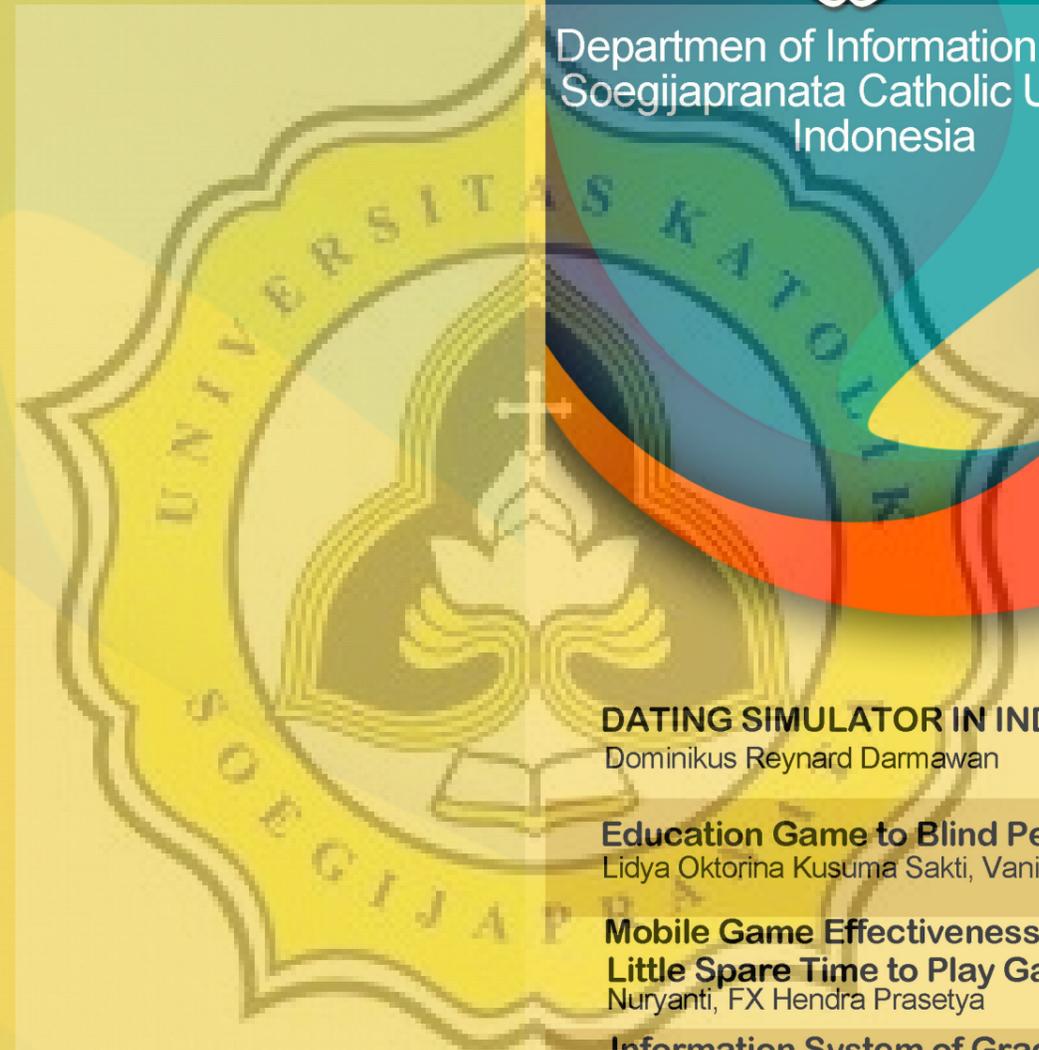




Department of Information Systems
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Education Game to Blind People

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Abstract— *Blind people have limitations because of partial or full visual impairment. This can affect their development like cognitive development and academic development. In order to do their social roles, blind people have obstacles. Even in education side, blind people still find it difficult to get their full access to study because their physic limitation makes them difficult to study like normal people.*

Now there are blind people who have their formal and informal education. Even though they cannot see, they can take benefit from another sense, like sense of hearing, palpability, smell, and taste. Their senses can be a modal to study.

Developer games have their build game in audio to blind people too. Their game is variation between audio games and online games, so games can be used for blind people as an education tools. In this paper, there will be an explanation about how to facilitate blind people to study with paper.

Keywords: *blind people, education, game, media, study.*

I. Introduction

Education is an effort to realize dreams with following learning process inside school and outside school. Everyone can actively develop their potential by using an education. It is realized that education is not only for people with perfect physic or normal people, but education is a right to everyone, including people with limited physical body like blind people. They have their own right to have a formal and informal education.

Education for blind people is important. As the next generation for their nation, they have to get their independent learning. In the globalization era, they need to get education, so that they can utilize their better chance. It will be better if blind people can compete with other normal people because blind people might be suffering to study. In learning process, someone is affected by some factors, like individual factors within themselves and social factors which are outside themselves [1], individual factors such as maturation or growth of individual, intelligence, exercise, motivation, and personal factors. The examples of social factors are family factors or household circumstances, learning tools, environment, available chance, and social motivation [2]. Therefore, it is important to know some factors that influence them. The aim of knowing some factors that influence learning process can be a key to solve blind people's problems to receive formal and informal education. As the development of the technology itself nowadays, there are so many technologies that can be learning tools to give blind people education, such as games.

II. Literature Review

2.1 Study

According to Hilgrad Sanjaya [3], studying is not to collect some knowledge, but study is a mental process which is done inside of mind, so that it can cause some behavior change. Mental activity can happen

because of individual interaction with the surrounding environment.

For blind people, doing an interaction with the surrounding environment often cause some problems. The problems are their bad experiences with other people, so that it can create trauma. Their confidence which has not been trained can cause a doubt within them to communicate and make other social contacts [4].

However, there are some problems which can disturb their activity of interaction for blind people which actually can be lessen by giving them guidance for developing a feeling of comfort, safe, happiness, and peaceful in their environment, training their courage to recognize new things, training their confidence and independence to communicate with other people.

In study process, blind people sure need a learning media which is suitable with their ability and suitable with technology development nowadays.

2.2. Learning Media

According to Shuharsimi Arikunto [5], learning media is an educational tool which is used as a mediator in a learning process to increase the effectiveness and efficiency.

Learning media is a helper as a learning tool which can be used by teachers to deliver information to blind people, so that they can have a good mark as a final result towards their hard work in study.

Using a learning media which is not suitable for the blind people can cause a failure in delivering learning material. Choosing a good learning media must be matched with the student condition.

Learning media for blind people can be a general use of a grope technique. By groping, blind people can know and understand numbers and letters, shape, and texture.

Groping is limited to range distance which is just arm length meaning that blind people cannot know things that are far away, or things that are too big, or things that

cannot be groped. For example, blind children cannot know the shape of fire because fire is too hot to be touched.

Except for groping, blind children can use their senses like hearing. There is a matched criterion for blind people; they can be helped by games technology.

2.3. Audio games

Audio games are games which use audio as a guidance from screen reader [6]. Like another game, reference [7] shows that audio games have types:

2.3.1. Action Games

Action games usually show a story which has a battle background, and by playing this type of game, they must have speed and precisely ability to complete the game missions.

2.3.2. Simulation Games

These games simulate an event or things, and these games do not show physical challenges to the players.

2.3.3. Sports Games

These games show some international sports. To become a winner in this game, players have to complete some game missions in physical sport.

2.3.4. Adventure Games

These games show quizzes, to become a winner, player must to solve quizzes in games. Some adventures games provide a physical mission, but it is rare.

2.4. Online Games

According to Agustinus Nilwan [8], a game is a structured activity that can be used as a learning tool.

Generally, online games are games which are connected with internet meaning that a player can be confronted to a strategy and a skill from another player in worldwide [9].

Online games are different from another game. Online games can be played anywhere and anytime, and this game can be useful for getting money by exchanging money in game with Rupiah or selling their characters in games [10]. If a player is patient enough to get money from the game, the player can get a lot of money.

Online games are game-based visual and audio, so this game can be played by anyone including blind people. If normal people use audio and visual aspects from game, blind people can use only for audio aspect.

III. Research Methods

3.1 Data Collecting Methods

Methods which are used to collect the data are:

3.1.1. Documentation Method

A Documentation method is a method to search data about facts such as note, transcript, book, magazine, newspaper, note of meeting, website, etc. In this method, literatures are used to find out how to teach blind people and to know games that have been developed for them. The games are audio games and online games. Figure 1 shows a flowchart for the audio games. These audio games provide a sport and racing theme.



Figure 1. Audio games flowchart for blind people.

IV. Result and Explanation

4.1. Audio Games for Blind People

There are game developers which have developed games for blind people. This game called audio games.

One of the audio games which can be used by blind people is Playing in the Dark Top Speed. This racing game is owned by playinginthedark.net that can make blind people who are playing the game can feel themselves as an international racer.

To play the game, blind people can use keyboard buttons such as left or right arrow buttons to navigate, up arrow button to accelerate, down arrow to put on the brakes, or shift gear with A button or Z button.

Besides of using buttons from keyboard, a player who is blind can use headphone to listen guidance, so they can play this game easily.



Figure 2. Audio games Top Speed 3 from playinginthedark.net

This audio game cannot be played by normal players, because the game does not have visual aspect, but only audio aspect.

4.2. Online Games for Blind People

As the technology is more modern, online games nowadays are not only limited for normal people, but blind people also can play games too.

One of the online games that can be played by blind people is A-pong game (Accessible Pong), a game which is made by Game Nusantara Online. This game is like a table tennis game for blind people.



Figure 3. Game A-pong (Accessible Pong) for blind people

Not only audio that can be heard, but the A-pong also can show graphics and audio.



Figure 4. Blind people who is playing A-pong Game

To play this game, they just have to sit in front of computer and use a headphone. Through a headphone, they can hear instructions to show where the ball is located.

They will hear tok' when ball is hit and whuush'like a sound of wind, they can estimate where the ball is without seeing computer display [11].

With online games like A-pong, blind people can feel how table tennis is, and they can receive sport lesson from the game. Besides, the game can train players'

confidence, concentration, and train their left and right brain.

4.3. Learning Strategy for Blind People

For giving an education to blind people, there is a learning strategy. In learning strategy for blind people [13], there are principles which can help teachers to teach blind people. The principles are:

4.3.1. Individual Principle

Teachers have to pay attention to the differences between one person to another. These differences are related with age, psychology, and physic. Thus, when a teacher gives a lesson via games, teachers can differentiate and make a group of what games are suitable for them.

4.3.2. Concreteness Principle

This is a learning strategy in which teachers have to provide a direct access to objects. Blind people are guided, so they can use their senses like hearing and palpability. This principle is related to learning media, such as games.

4.3.3. Totality Principle

In this principle, blind people can get their real experience. Like concreteness principle, blind people have to be able to take benefit from their senses which are still functioning. To get their experience in playing games, blind people use their senses, except for visual sense, like palpability to grope keyboard buttons and sense of hearing to hear instructions from games.

4.3.4. Independence Activity Principle

Learning strategy must have an ability to push blind people to learn actively and independently. In this case, blind people have to work and experience how to play games.

With all of the principles, learning strategy can be done with the aim to teach

blind people, so they can become independent in doing their life activity.

V. Conclusion and Suggestions

Learning media which can be used to facilitate blind people in their study is games. Games nowadays have been developed fast, as a proof; there is an audio and online game like A-pong which is only for blind people.

With this audio and online game like A-pong, blind people can experience how to play games, train their independent ability in doing such life activity, and for sure the games can train their senses which are still able like palpability and their sense of hearing.

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