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i-JaMCSIIX 2021
Exploring ideas

International Jasin Multimedia & Computer Science Invention and Innovation Exhibition

International Jasin Multimedia & Computer Science Invention and Innovation Exhibition
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EXTENDED ABSTRACT
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CONTENTS

Dental Treatment Orientation for Children using Role Playing Game

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Abstract—**Dentistry is the act of practicing the diagnosis, prevention, and treatment of diseases, injuries and disorders of the teeth and surrounding structures of the oral cavity. Dental needs are related to one's body health so one should bear the responsibilities to take care of it. However, some children get too overwhelmed by anxiety at the mention of dental treatment making the dental visit become a hard work. They are also lack of awareness about the importance of dental health due to the young age. Therefore, the goal of the developed game is to help them reduce their fear of going the dentist by demonstrating the procedure through an enjoyable orientation using Role Playing Game. Modified Waterfall Model has been chosen as the methodology for this project because whenever required, the phases in this model can be overlapped. Hence, the development for this project will be flexible as few tasks will function concurrently. Game elements such as challenge, rule, reward, theme, and progress are employed in the game. The platform chosen for the game is a stand-alone on PC. The design of the game is Role Playing Game where the player has to accomplish few missions during their trip to the dentist. Usability testing for the developed game involves 20 respondents. The result of the test shows a positive result as most of the respondents enjoyed and satisfied with the content of the game. However, the majority of the respondents requested more missions. Further enhancement can be added to the game such as add online features to the game.**

Keywords—*dental treatment orientation, role playing game, children*

I. INTRODUCTION

Dentistry is the act of practicing the diagnosis, prevention, and treatment of diseases, injuries and disorders of the teeth and surrounding structures of the oral cavity. Dental needs can be quite connected to one's body health so one should bear the responsibilities to take care of it. Responsibilities include the repair and restoration of teeth, the replacement of missing teeth, and detection of diseases that might require treatment by a dental specialist or doctor [1]. Usually, dental needs may depend on the personal habits, self-care routines, and one's lifestyles. The importance of dental hygiene are acknowledged as to enjoy eating, achieve stability in emotion, as well as contributing to a lovely smile.

Orientation is like a training session before actually performing or doing a specific task. It can helps in adjusting to a new surrounding to make an event flows smoothly when the time comes [3]. For example, secondary school students go through about one week of orientation before actually starting to go to usual everyday classes to get to know the new atmosphere of secondary school such as where the classrooms are, how to buy foods at the canteen, when to be at the assembly point, who are the teachers to certain subjects at so on. In this case, the orientation will benefits both the students and the school itself as students will become less nervous about facing a new surrounding as well as the school will become more organized when the real study session starts.

On the other hand, role playing game is a game where the player controls the character's role in an imaginary world for a certain quest. The flow of the game depends on that choices did the player made as though the player is living the moment themselves. Some advantages of role playing games are that it can cultivates creative and critical thinking under a certain situation, levels up social and problem solving skills, as well as enriching language and communication [5].

II. OBJECTIVES

To reduce children's fear of going to the dentist, they will be comforted by positive words during the role playing dental treatment orientation. It also could help the children to be ready before actually going to the dentist as the children already go through the step by step procedure of going to the dentist to get a dental treatment. Thus, there are three objectives to be fulfilled in this project.

     i.   To design a role playing game of dental treatment orientation for children.

    ii.   To develop the designed game.

   iii.   To test the usability of the game.

III. METHODOLOGY/ TECHNIQUE

The methodology used in this project is Modified Waterfall model which is the modified version of Waterfall model. But, the updated model, unlike the conventional waterfall model, allows project phases to overlap and still includes phases in the traditional waterfall model: requirement analysis design implementation (or coding), testing and evaluation, and maintenance [2].

The reason this Modified Waterfall model is chosen as this project's methodology is because whenever required, the phases in this model can be overlapped. Hence, the development for this project is flexible as few tasks function concurrently as mentioned by [4], the simultaneous running of subprojects can reduce overall development time and can help to identify potential problems earlier in the design and development process. Therefore, changes to the basic design can be made easily, as there are a number of phases active at one point of time. There are four phases for this Modified Waterfall model which are Requirement Analysis phase, Design phase, Implementation phase, and Testing and Evaluation phase. Fig. 1 shows the phases of the Modified Waterfall model.
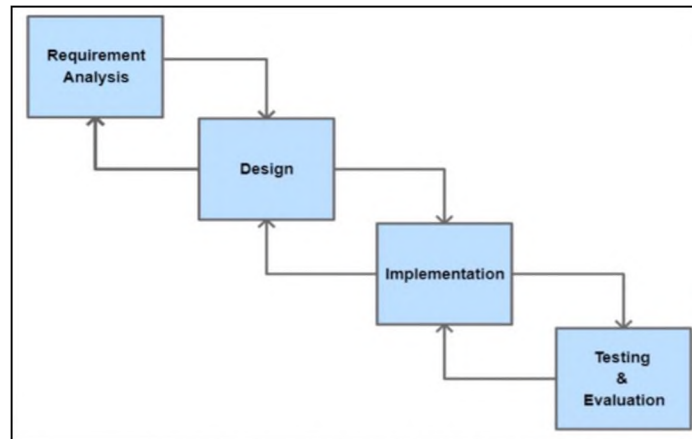

Fig. 1. Phases of Modified Waterfall Model

IV. RESULTS AND FINDINGS

A testing session to evaluate the usability of the developed game has been conducted. The objective of this testing is to check whether children get less anxious about the thought of going to the dentist after playing the game. The test has been carried out with six children aged from eight to eleven years old. The testing is based on the questionnaire given and observation of the recorded reaction of the participants while playing the game.

The testing was conducted in participants' house with their own PC. The PCs are first installed with the developed game. A camera is set up facing them to observe their facial expressions while playing the game. A pre-test questionnaire has been distributed to the participants and had to be answered before they start to play the game. After done playing the game, they must answer the usability test questionnaire.

A. Analysis of Observation

Based on the observation, most children do not bother to read the role play dialogues. They just skipped whenever there are too many words shown. Some participants also stated that some parts of the instructions are a bit unclear. For example, during the Checkup Mission, most of them took quite some time to figure out what the password is. This might be because they are not familiar with this type of game due to their young age. The children also could not find the inventory feature where they can check the items that they had collected. Fig. 2 shows the children confused reaction during the gameplay.
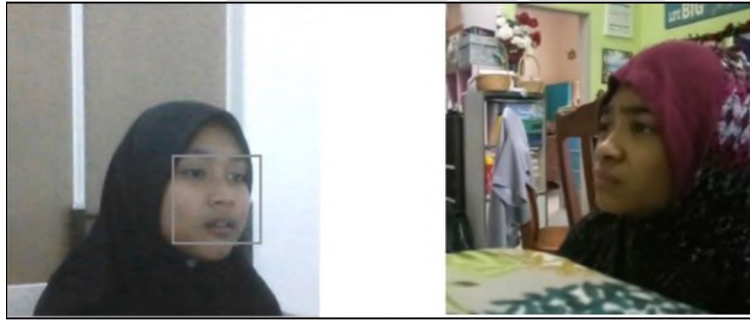
Fig. 2. Participants' Confused Reactions

B. Analysis of Questionnaire

Fig. 3 shows the result of the gameplay/challenge section. Based on the result, most of the questions ask for this section received balanced feedback. This might be because of the balanced distribution between children who often play games and those who rarely play games.
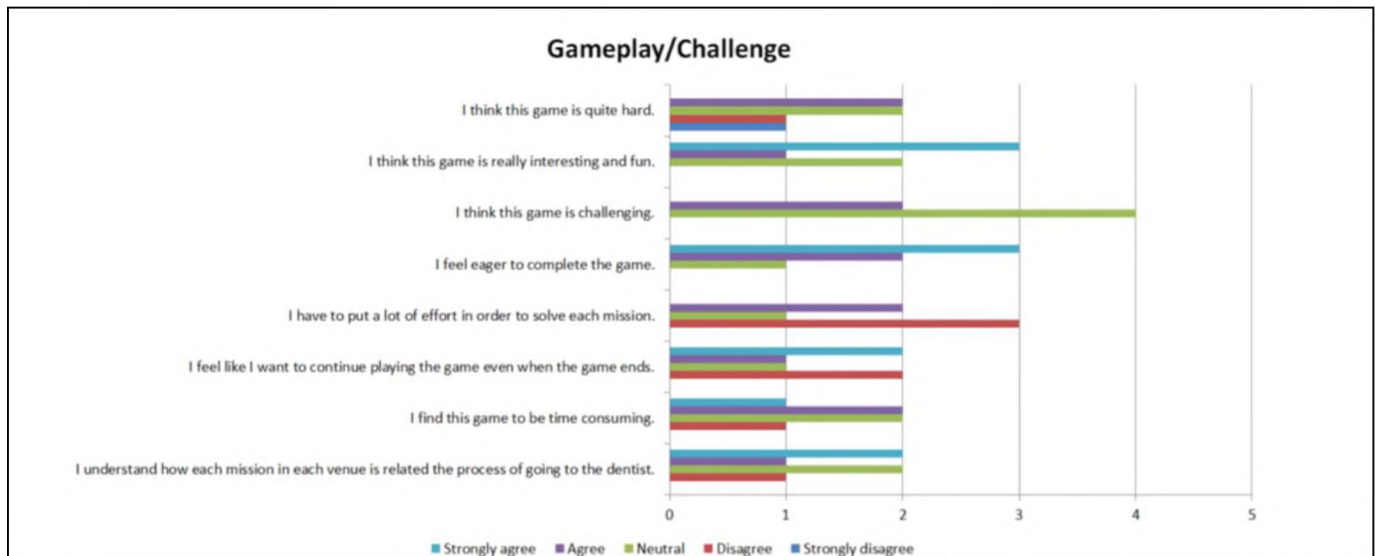

Fig. 3. Result of Gameplay/Challenge Section

Fig. 4 shows the result for the content section. Based on the overall result, most of the participants gave positive feedback regarding the content of the game. It is hardly anyone disagreed with the statements in this section except for the question about whether the content of the mission was easy to understand. This is likely due to the poor instruction flow in the game.
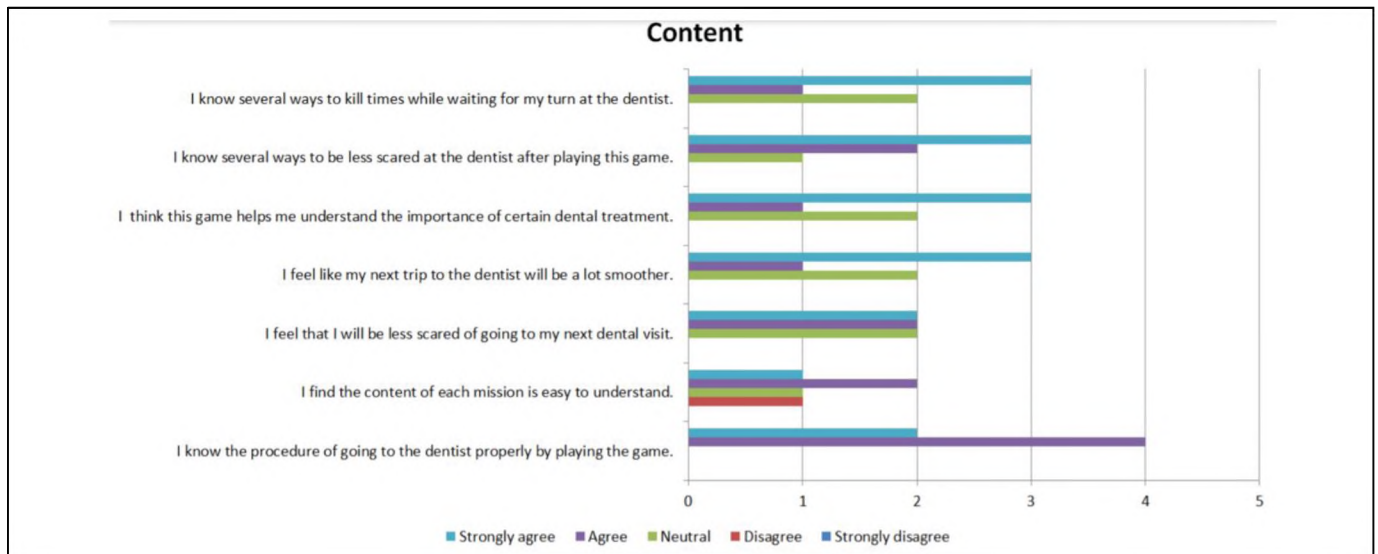

Fig. 4. Result of Content Section

V. CONCLUSIONS

Usability testing has been done through observation and questionnaire. The testing is conducted with six children aged from 8 to 11 years old. The questionnaire is divided into six different sections and each section contains difference findings. The behavior of the children is observed during the gameplay. Based on the evaluation, usability testing gives positive feedback resulting in 82.92% of students like the content of the game.

Overall, all the objectives of this project have been completely achieved. The first objective is to design a role playing game of dental treatment orientation for children that is done by conducting several researches about children dental fear, technique of reducing anxiety, and game elements. The second objective is to develop the designed game which is done using game developing software named RPG Maker MV. The third objective is to test the usability of the game by handing out some questionnaire to get responses and feedback for the developed game for further improvement purposes.

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