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Review Article

DESIGN AND DEVELOPMENT OF SIMULATION GAME FOR FITNESS PROGRAM

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Abstract

The media often express concern on the consequences of playing so much video games which can affect players ' feelings as well as their health. Due to that, several researchers have studied on the motivating factors that influence the positive emotions among video games' players. Therefore, the aim of this research is to increase the awareness of players on the health condition like obesity in order to get daily information on related training. The approach focused is more on change response and team members, incremental and iterative than on instruments and plans. As a result, the project planning processes have achieved well. The tests of usability by non-players, amateur players and professional players will help to achieve the objectives of the study. The analysis has showed that this game 'Fat To Fit' can help to motivate people to practice as well as to achieve their targets. The result achieved is a simulation game that motivates people to begin exercising, which is based on the test result and the review. This test has demonstrated that the participants have the feeling that they have received a great piece of information during the workouts. The findings have shown that the creation of health care games would boost the game's efficiency by increasing the game's successful outcomes.

Keywords: Fat to Fit, Fitness, Health Games, Interactive Media, Simulation Games, Technology, Video Games

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INTRODUCTION

Millions of people enjoy playing online games, yet not much have impacted on their lives and wellness. However, in the latest edition of the American Psychiatric Association (APA)'s Diagnostic and Statistical Manual of Mental Disorders (DSM5), which published on DSM5, some players often have issues with safe games (Lehenbauer et al., 2015). Video games are popular amongst young children, where most of them have spent a total of 45 minutes in 1 hour a day for playing games of their preferences. According to Isabela et al. (2014), this attitude has impacted most of children's psychological development which somehow may later lead to potential violence, depression and addiction. In 2010, in the United State, a total of video games that cost of $25 billion have been produced and paid by players. Thus, many researches have been carried out on the abusive actions of children and teenagers while playing with computer games. From the findings, it has found that the factors that lead to addiction of playing games and others important factor should be look into. Nevertheless, there is a need for a more holistic perspective, especially on the impact of video games on children and young people, as well as taking into account not only possible negative consequences but also their benefits (Isabela et al.,2014). On top of that, the significance and difference of video games and other media, like books, TV and movies, should be specified too. Interactive nature is the essential characteristic of video games; where players cannot abandon a game plot passively. This has shown that video games have been created to allow players to interact with their systems and respond to player-centered actions (Isabela et al., 2014).

Educators in the 21st century are now facing younger generation, which has a great ICT qualification and they are also being exposed to abundant of information sources (Siti Nurul Mahfuzah et al., 2019). This is supported by the report produced by MCMC in 2009. The findings showed that the number of Internet players has risen to 79.8 million from 2005 to 2008 over 28 hours a week. Initially, the Internet is used primarily for information collection, social networking, document processing, learning and uploading (MCM, 2008). To add, the study carried out by MCMC in Malaysia has found that there are two main reasons why students are really attached to the Internet. The first reason is due to the interactive asynchronic events which including e-mail, forum discussion, online chat and shopping, particularly at websites for auctions. Next reason is due to the non-interactive things include Internet surfing, installing and watching games and movies (Fadil et al., 2015). To add, the positive and widely accepted computer games among players, in particular children and adolescents has also triggered the use of Internet (Perrin et al., 2015). On the other hand, many commercial video games require the use of various skills and skills by players (Barr, 2013). However, little empirical evidence of the effectiveness of commercial video games in developing graduate skills while evidence indicates that video playing can lead to positive social and cognitive effects (Granic & Engels, 2014). This research was designed to measure the impact on the achievement of certain graduate attributes of playing commercial video games. In addition, it would also be necessary to test the hypothesis that playing selected games would increase students' scores for measuring graduate skills. Most video games are feature games of action, action and fantasy, adventure, role play games, strategy and sports.

PROBLEM STATEMENTS

There has been a rise in the number of obese in Malaysia, equivalent to that in the United State (Huda, 2018). Yet, we do not know how unhealthy and what can be resulted from obesity. First, not everyone has the motivation to exercise due to a couple of reasons. Next, people sometimes do not exercise because they do not know how and where to start. Consequently, this 'Fat to Fit' game has been developed to assist and help people to get details on the basic exercises, which later can help them with their weight problems.

GAMES AND SIMULATIONS

Games and simulations are commonly integrated with rapidly developing technical technologies into the conventional educational process (Dimitrios & Agoritsa, 2017). Games are widely used in education, training and working group (Yang et al.,2010; Chiang et al., 2011). There also researchers who examined the effectiveness of games and sports in learning, yet findings have showed that no clear empiric evidence have been found (Farrington, 2011). According to Cónnolly (2012), sports games have already been included in educational systems to some degree to ensure a range of learning outcomes.

Video games are mostly used as an immersive electronic games. Video games allow players to explore the virtual world of 2D or 3D under a various game-to-game rules and conditions (Connolly et al., 2012). Like any other media format, video games are divided into categories. This classification depends on a variety of factors, such as how the game interacts. Moreover, there are various features in each video game that make other video games popular. Several video games, including action, adventure, fighting, racing, roles, shooters, simulation, sports and strategy, have been played worldwide. He also found that games that embedded with the 2D function are better, simpler and player-friendly. The central purpose of creating the 2D games is for motivation. In order to motivate individual to engage in certain activities, motivation is created, and health is the subject of this project 2D game, which makes objects move about, based on sprites and drawing on a flat surface. Such games have a graphic design that is rather powerful. The 2D games limit the movement of the player to a flat plane, usually right and left, but possibly in different directions. As the dimensions of the game decide the range of motion of the characters, the mouse is used by 2D games or digital pads. It enables the player to quickly control the game without learning new, complex technologies.

In fact, most players, specifically for children and teenagers, agreed that playing video games are just for fun and they also agreed that it was very time-consuming. Video games may influence players as well as to identify whether they are good or bad in forming other human behaviour. Consequently, many researchers have developed an interest to study the video games in the fields of education, computer science, psychology and youth development (Wolf,2019). Most researchers have validated their conclusion by demonstrating on the players' abilities. Players' abilities such as concentration, problem solving, creativity, social behaviour shift, increase or decrease, by adjusting the criteria or levels of games. For example, researchers have assessed the players' concentration skills by analysing space results at shooter games, where the players' spatial results increase or decrease means that their player concentration increases or decreases. Problem-solving skills can also be evaluated by considering the outcomes of strategy games either improved or declined (Wolf,2019).

SCOPE

The purpose of the game is to encourage players to dumbbell and leap over the cords in order to lose weight. It starts by selecting suitable tool to play. Later, players will hit the next level when the game is finished. Then, players will then perform another task until they reach their weight reduction goals.

EXISTING SYSTEM

There are many lose-weight games being developed. Currently, the best games are developed by Unity software. In the meantime, Anton Tonev has also developed a game called Fat Man, which has the same features as this project. The game which has almost the same features as Lose Weight created by Hassan Sheik. There are a few similarities with the proposed game Fat to Fit for Fat Man and Lose Weight. The comparison is as shown in Table 1.

Table 1. Comparison of existing system with current system

System Specification	Fat Man (existing system)	Lose Weight (existing system)	Fat To Fit (proposed system)
Interactivity	Yes	Yes	Yes
Target Player	All	All	Adult
2D/3D	2D	2D	2D
Purpose	Entertainment	Entertainment	Motivational and Entertainment
Information about fitness	No	No	High information

The fun platformer tends to please younger players amid with a few small issues. Within Fat Man Adventures, a small, round character must be managed, who is more like a 'blob' than an actual man. The players' function is to manipulate the different platforms or threats within order, as well as to collect every gem on the boards and finally escape from the enemies. The graphics are bright, but Fat Man Adventures is quite tiny, which makes 'him' sometimes difficult to see. There were not many enemies on the few boards, and therefore the enemies were there did not seem hostile. Fortunately, Fat Man offers a good set of features, including the ability to play in window mode, to reconfigure the control keys and to adjust the sound effect and music volume. Nevertheless, the biggest problem with this game is its 43 MB size, which seems disproportionate in the sense of 2D standard graphics, apart from a very slightly shaky five-level court. For those who enjoy traditional platform games like Super Mario Bros, Fat Man Adventures are likely to be a one or two stage experience. Meanwhile, A Lose Weight is a fat man's simulation game, where players have to workout to lose weight. Activities such as dumbbells, treadmills, hop over the bridge, height jumping, and push-up exercises are being embedded as practices to lose weight.

METHODOLOGY

Agile Production Cycle

This project is based on the Agile production cycle. In this project, it has been applied to ensure the effective development of this

product. Agile is designed to adapt to any changes and the need for faster development of software. This process leads to a prompt and efficient release, if everything goes well. According to Figure 1, agile development is a process which makes PC's games work better. This approach includes systematic and iterative aspects, focusing not only on tactics and plans but rather on adapting to changes and team members. Nonetheless, each methodology has slight variations in how it being described in the software development phases. Each element of a game is taken from and is produced from the "to - do" list of items. The prototyping of this specific element is controlled and prototyping process is continued.

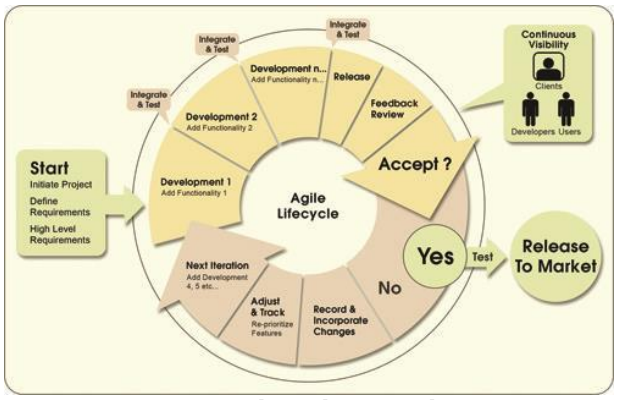

Fig. 1. Agile Production Cycle.

Development phase

The quality of games has been adapted and expanded by developers to meet demands of the industry and the target players during the development process. In this point the contents of the game during the production stage can always be changed.

Pre-Production

At this stage, the design of the game is determined. The identification of features and suitable elements are deemly required.

Production

The objective of the production phase is to develop the game. This step aims in the previously planned date to establish some features of the game. Instead of a single, separate process step, the whole system is constantly prototyped.

Post-production

In the post-production stage, some changes should be made in order to suit with the player's preferences and needs. Here,. the players' input will be collected, which creates technological changes that can be iterated and modified to an existing player base afterwards.

GAME DESIGN AND DEVELOPMENT

The game design is a collection of features that is being structured well. In this process, the games' features is being explained well. On top of that, the storyboard shows the entire scenario, especially on how to execute the process as well as the functionality of the games. This segment discusses the game GUI. Figure 2 demonstrates the game's assembly. To begin, the player must press the Play button.

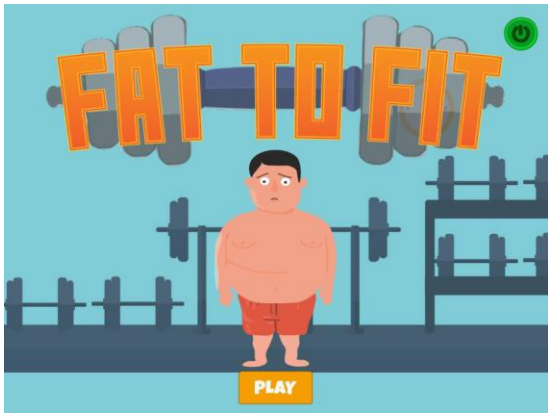

Figure 2. Montage

Figure 3 shows the game's main menu. It provides players with instructions on how to play the game. In order to leap whenever the rope gets closer, players must click the spacebar.

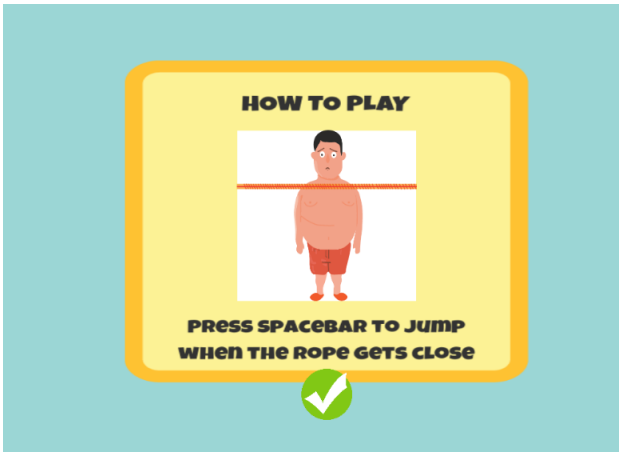

Figure:3 Games Main Menu

Figure 4 displays the Game Play screen. The animation is the skipping cord movement and the players' action. When the skipping string comes up, players must leap and count the points.

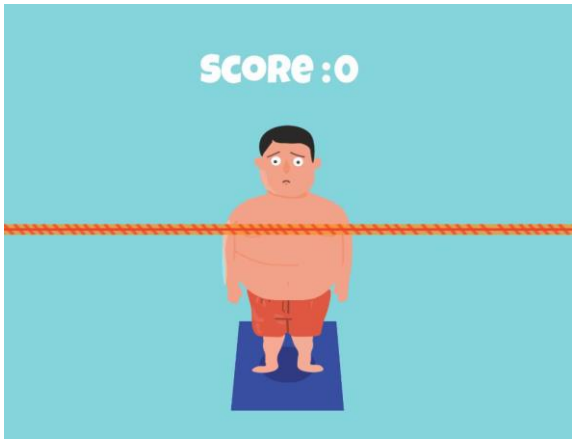

Figure 4. Game Play

This is an indication, as shown in Figure 5, of media involvement in this initiative. Media incorporation is very important in the process of game development because it enriches the experience of the game consumer. The developer

must design each scene in this project as well as incorporate all the elements like text, graphic and audio into an entire screen. Next, to choose the best topic for this game is imperative. This is the guidance of the creator and it enriches the fantasy element in this game. Next, the developer uses bright colors on a wide scene. The music background for the whole game is also played. The background music will loop when the player clicks certain button. That button will cause the player to immediately touch and fire a click sound in that game. The entire graphics are generated using Adobe Illustrator and are imported into the Unity as 2D graphics.

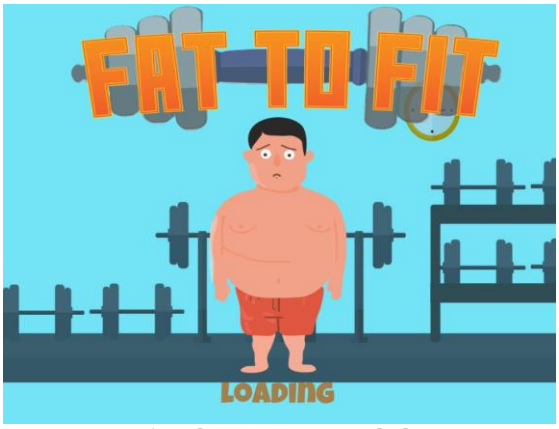

Figure 5. Media integration in splash screen

CONCLUSIONS

Overall, the development process of any project is considered as the most critical stage. This is because, in creating any games an early preparation and investigation are needed. The need to gather all public outreach and assessment in order to identify project priorities, expectations, goals, concerns and impacts are important. In addition, educators have to take into account relevant game features that can be used in teaching and learning to successfully incorporate gamification. The goal of the project is to increase awareness of the danger of obesity and provide players with daily training details. This project suggests that the exercise training game can inspire players to play as well as to raise awareness of the importance of keeping oneself healthy. Another factor is the standard of the games. Poor games make little use, as a well-received player tend to show their own choices in playing any games. The willingness of the participants to participate in the study is likely to be undermined too (Matthew, 2017). Nevertheless, there is a flaw in this project, like the lack of game details for a person to lose weight. Some of these games have changed significantly, and become more complex, fluid, realistic and more systemic in the last decade (Ferguson & Olson, 2013). Besides, the similar study of the effects is required. Next, this research can only be impeded by misinformed attitudes to video game media that are omnipresent and very common. For addition, innovative educators will be able to update digital content which related to the technology 4.0 and this will lead to the increment of participation among students to use the technology (Siti Nurul Mahfuzah et al., 2019). Finally, it can be inferred that the creation of the game app is more effective and functional (Che Ku Nuraini et al., 2019). To sum, a good interactive digital games and simulations will be able to encourage students to engage with their coaches as well as their co-players, not only with the game.

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CONFLICT OF INTEREST

There is no conflict of interest between the authors.

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