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WhysoSeriousGame: A Conceptual Framework for Learning Motivation through Serious Game

Marzita Mansor*, Rohaizah Abdul Wahid, Suliana Sulaiman, Asma Hanee Ariffin, Nurathirah Azme

Fakulti Seni, Komputeran dan Industri Kreatif, Universiti Pendidikan Sultan Idris;
{marzita, rohaizah, suliana, asma}@fskik.upsi.edu.my, m20171000246@siswa.upsi.edu.my

** Correspondence author*

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Abstract

The aim of this paper is to construct a framework for serious games' motivation in learning. Additionally, it attempts to emphasizes the importance of motivational factors as an integral component of serious games for university students. Existing research on serious games for university students' learning is insufficient, and students are reported to be discouraged from exploring serious games in their learning. Thus, the objective of this paper is to develop the WhysoSeriousGame framework in order to provide a comprehensive, serious game-based framework that emphasizes motivation as a critical aspect of learning. Additionally, this paper provides a description on how the framework can be implemented in teaching and learning for university students. The framework also serves as a source of reference for future Serious Game development.

Keywords: serious game, learning motivation, framework

INTRODUCTION

Serious Games, a type of game-based learning, are educational games that place a higher priority on pedagogical aims than on entertainment. Serious games, as described by Johnson et al. (2017), are digital games that serve a purpose other than enjoyment (for example, marketing, training, and teaching). Later, Michel and Shen (2006) expanded the definition of serious games to include games that are not primarily intended for enjoyment, pleasure, or fun. This idea emphasizes the educational component of serious games as the key component. Serious games are often defined as those in which the primary objective is education rather than entertainment (Romero, Usart & Ott, 2015). In a nutshell,

serious games are educational games that incorporate both educational and entertaining components, but prioritize the educational component in attaining the game's objectives. Serious games, named 'America's Army', were initially launched in 2002 against the United States (US) Army. "America's Army" is a first-person shooter game that the United States Army uses as a practice or simulation for real-world combat (Susi, Johannesson & Backlund, 2007). Since then, academics have discovered that serious games have the potential to be used for a variety of additional educational objectives. Later on, serious games were developed for a variety of purposes, including healthcare, public policy, training, science, corporate management, advertising, education, and simulation, all with the common goal of conveying information or knowledge through games. The purpose of this study is to examine the reasons for the issue that has occurred as a result of the lack of use of serious games in learning for university students. Despite all of the promise that serious games hold, investigating the use of serious games in the learning process at universities can be considered useful.

Most serious game definitions attempt to emphasize that serious games are games that focus on instructional components rather than entertainment or enjoyment. This view is completely incorrect, as serious games should also focus on the player's or student's fun and enjoyment in order to ensure that the serious game is playable. For learning to occur, teaching and fun must be harmonized. The enjoyment aspect of a serious game is also crucial to keep students interested in participating in the learning session. Since the game creator developed serious games with additional pedagogical elements, someone else should perform roles to ensure students' involvement is maintained throughout the learning process. According to Marklund & Alklind (2015), teachers are an important part of the system that surrounds the development and use of educational games. As a result, Wu (2018) proposed that teachers participate in the adoption of serious games in the classroom. It is reinforced by Lidgren's (2017) claimed that how a teacher uses games during a class is seen as more essential than what individual games are used and how they are constructed. One strategy for teachers to keep students motivated to participate in the serious game is for them to participate in the lesson as well. However, a correct method of motivating students should be highlighted as a guideline so that teachers do not motivate their pupils in the wrong way. Many studies have been undertaken on game-based learning employing serious games, but there are still a limited number of studies using a conceptual framework to explain motivation in education (Seaborn & Fels, 2015). The issue of how game-based learning with serious games might work by leading students' motivation remains unresolved and undiscovered. In one study, Michel et al. (2016) said that one way to solve the issue is to relate psychological theories of motivation with the serious game. This study attempts to answer this question by building a conceptual framework based on a few related and well-established psychological theories of motivation. The method of implementing game-based learning using serious games in the classroom may appear simple because the teacher merely needs to allow students to play games while studying. However, the process of implementing serious games is more complicated than it appears. This is due to the fact that the teacher must ensure that the students are not simply playing games in the classroom with no goals. Instead, by the end of the learning session, the learning outcome must be realized. Students will not properly acquire the academic knowledge that is supposed to be learned if they are not motivated during serious game learning sessions, and the learning outcomes will not be

accomplished. As a result, when adopting a serious game in the classroom, it is critical for the teacher to refer to the appropriate conceptual framework surrounding serious game learning motivation.

With that, the objectives of this paper is to develop a conceptual framework of Serious Games that can be utilized to implement the benefits of serious games as a method of instruction for university students. Conceptual model of WhysoSeriousGame is a framework that provide comprehensive coverage on serious game and motivation components in order to provide understanding on how these two concepts integrate with each other to assist learning. To accomplish these goals, relevant psychological theories of motivation, as well as previously published notions and models, are analyzed. By examining and revising conceptual frameworks for game-based learning and theories of motivation, it is possible to include relevant concepts and theories into the building of a conceptual model for serious games. Thus, the incentive and mandatory components of learning are able to encourage the usage of serious games as an acceptable method of learning for university students.

LITERATURE REVIEW

Research in the area of game-based learning is widely implemented, with an emphasis on ways to improve the design of game-based learning for implementation in learning activity. Since games began to be seriously applied for educational purposes, various types of games that are more conducive to education have been introduced, including serious games. Following that, a comprehensive examination of the conceptual paradigm of game-based learning is conducted. De Freitas and Oliver (2006) conducted an early study on the education, game, and simulation framework with the goal of assisting tutors in evaluating education games and simulations. However, Westera et al. (2008) believe that instead of focusing exclusively on evaluation, the researcher should build a framework that examines the game's design. Amory (2007), on the other hand, suggested the Game Object Model (GOM) II, which examines the game's design in synchronization with Westera. Amory's (2007) framework facilitates game creation by defining the game's interface needs, the game's difficulties, and also the game's social space. The framework's flaw is that it was too broad and ignored Kiili's (2005) gameplay and flow theory, leaving the game creator with little advice. Westera et. al. (2008) also proposed a framework which refers to the expansion of the basic architecture of scenario-based game development. Westera et. al. (2008) claimed it was stronger as the framework liked software called Emergo. However, the framework proposed by them was still in the theoretical stage and did not offer any design solutions to work with other game design tools. The intention of the Emergo framework is to provide a feasible solution to the use of games in education, which is said to be limited and existing game design goals fail to match pursued learning objectives (Westera et al.. 2008). In regards to the use of theories in serious games, several theories have been embedded with the intention of providing supporting solutions to be applied in the implementation of serious games for learning purposes. The Activity Theory-based Model of Serious Game (ATMSG) was later introduced by Carvalho et. al. (2005). This framework applied several identified theories to promote understanding of user differences and various development processes that reflect their learning. The ATMSG model focused

more on serious game components and learning taxonomy. The taxonomy supports the analysis of serious games by listing the commonly found structures in serious games. In addition, the ATMSG model can also be applied at the early stage of serious game prototyping as a tool for conceptual design. This helps serious game designers in assessing whether the envisioned game structure is able to support pedagogical goals as required or not. Indeed, more and more conceptual frameworks or conceptual models are developed by researchers around the globe each day. Game design and the fundamental psychological needs, such as motivation, are intrinsically connected as shown in the research by Tan (2020). However, there is still a lack of studies emphasising the importance of the teacher's role in implementing games in the teaching and learning process that motivate learners to learn. Hence, we proposed a conceptual framework relating to serious game implementation and students' motivation to fill the gap by helping provide understanding and guidelines for teachers regarding the importance of maintaining students' engagement in serious games through motivation.

THE CONCEPTUAL FRAMEWORK OF WHYSOSERIOUSGAME

The philosophical underpinnings of WhysoSeriousGame were influenced by the work of (Westera et al. 2008). The WhysoSeriousGame concept was developed starting with the authors' recommended game components described as a subsystem of the educational game environment. The game components named the world of game management, the world of learners, the world of teachers, and the world of game play are all well depicted in Figure 1. Students learn in the realm of video games by engaging with the game's environments and aspects. The game takes place in the player's reality, which is distinct from that of the learner. Similarly, the teacher world provides a metachannel that extends beyond game play and enables tutors to track progress, provide feedback, and intervene while the user is engaged in a game activity. To motivate students to learn, motivation components must be embedded into the serious game's design as a supporting component. With that, the extension of Westera et al (2008) work is necessary to be done with an additional motivational component suitable to be embedded as a serious game component relevant to university students.

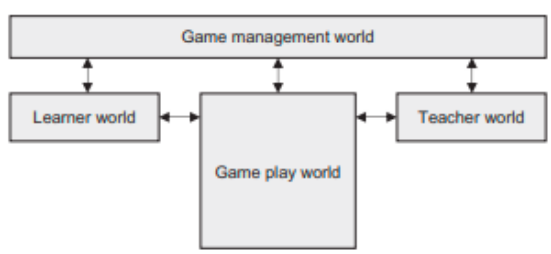

Figure 1: Westera Serious Game Components

The proposed conceptual framework for motivation towards serious games is presented and explained further in the next section. Similarly, with the previously defined aim of other research, this paper presented the exploration of the serious games concept with the intention of representing the

description of serious games and the motivation to create new knowledge in the form of a conceptual model that is well depicted in Figure 2.

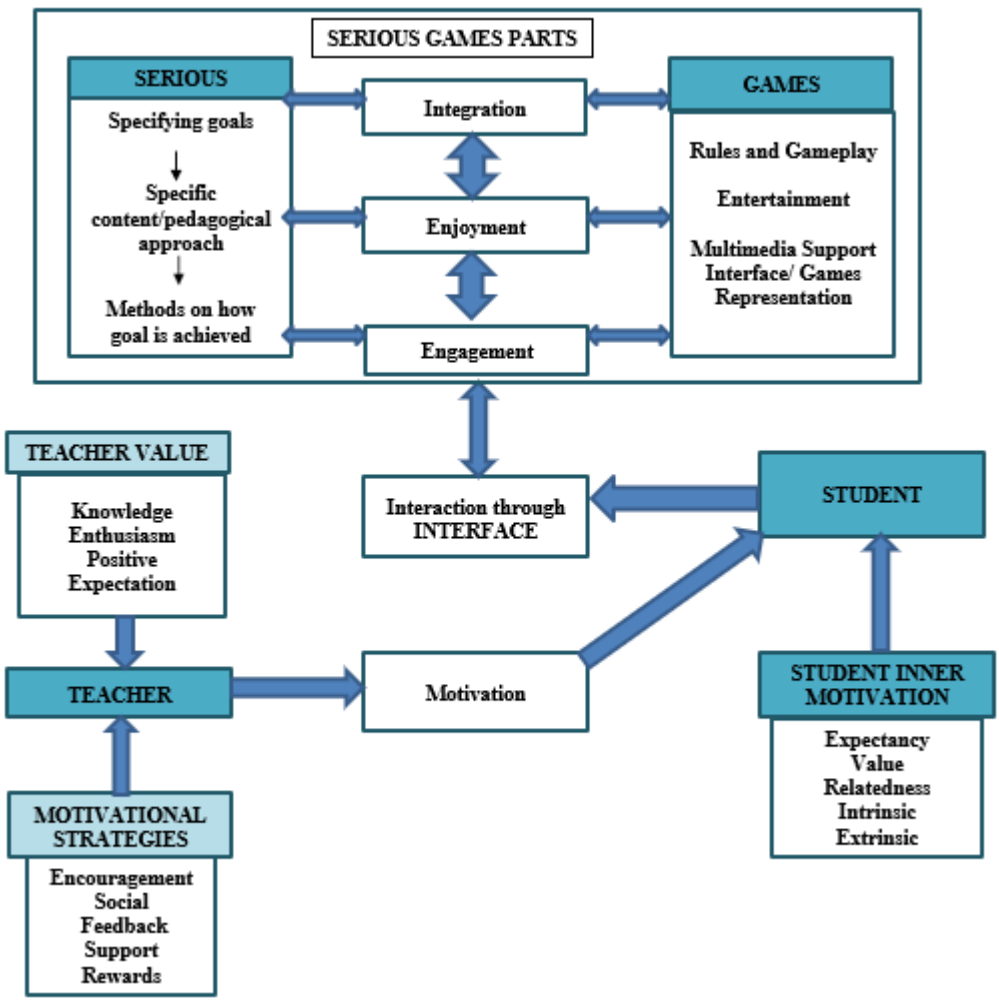

Figure 2: Conceptual Framework of Motivation towards Serious Game

Figure 2 is a conceptual framework of motivation towards serious games which visually represents the elements of a serious game and motivation strategy. The elements of this framework will be briefly explained from left to the right and from the top to the bottom. Serious games are divided into two parts; the serious part, which caters to the pedagogy part of learning. The serious parts are where the

goals are specified, the contents are determined, and the methods carried out to achieve a specific goal are also determined. On the other hand, the games part contains the rules of the games, entertainment components, and multimedia components that support the interface and representation of games. All of the serious and game components are integrated, and interaction with the game interface promotes enjoyment and engagement. Meanwhile, an entertainment element also exists to keep the game as a game, ensuring the students are still entertained. However, the key challenge is to keep both elements balanced for the sake of engagement. Thus, this is where the researcher proposed to inject motivation as a support to ensure the engagement is balanced. The crucial part in the framework, the motivation parts of the use of serious games, comes from two sources: the external motivation strategies of the teacher and the student's intrinsic motivation from within. In regards to the teacher values, according to Eggen (2016) in the Classroom Model for Promoting Students' Motivation, teachers pose several qualities that help increase the students' motivation to learn, which are enthusiasm, knowledge, and positive expectations. The enthusiasm element in the framework refers to the teacher's enthusiasm for working hand in hand as they believe that intelligence and ability can grow with hard work and focus on learning and improvement. Knowledge quality is referred to as the knowledge held by the teachers, which includes teaching strategy and also content knowledge. The positive expectation of the teacher promotes competencies and healthy attributions as the teacher typically treats high-achieving students a little bit better than the lower-achieving ones through emotional support, effort, questioning, and feedback. These elements will raise a feeling of competing among students to be one of the higher achievers. The qualities posed by the teachers should be inserted during the teaching and learning process using Serious Games as a teaching strategy and tool.

Referring to a few psychological theories of motivation (self-determination theory, expectancy-value theory, and intrinsic and extrinsic motivation theory), five main factors for students' motivation in learning, namely: expectancy, value, relatedness, intrinsic, and extrinsic are identified. Expectancy is defined as the students' expectation of how well they can perform a certain task. This factor is important to ensure students are confident in their ability to do well in the learning process. The value element refers to the thought of how important the knowledge is to the students themselves. The students need to know the usefulness of the knowledge so that they will be more eager to work harder for it. The relatedness element basically refers to two factors: first, the feeling of relationship within the students' prior knowledge and the knowledge that they will learn; and second, the social interaction between the students during the learning that makes the session more fun. The next factor, intrinsic, is defined as the students' willingness and eagerness to learn more and more, which occurs inside their minds. This factor is more related to self-satisfaction instead of external factors such as extrinsic, which refers to the reward or other outside achievements gained when students do well in learning. From the motivation factors listed, five motivation strategies that should come from teachers as motivational strategies that help students learn: encouragement, social, feedback, support, and reward are identified as external motivation strategies that are able to help students learn using serious games. These strategies could also be used to motivate students to engage in serious games. Encouragement is referred to the encouragement given by the teachers during the learning session. The teacher should emphasise the importance of the knowledge the students will gain, thus making the students more

eager to learn. Next, social is related to the relatedness factor explained before. If the teacher promotes group activity or social interaction during the serious game learning, the session will be more fun instead of stressing and boring. The teachers should also provide feedback for each activity to ensure the students know their level of achievement and motivate them to strive to do better. The same goes for support. Teachers should keep supporting the students even though they might not do well in the earlier phases. Last but not least, rewards are also one of the best ways to keep students motivated and engaged with serious game learning. The reward approach, however, needs to be remembered not to be too much, causing the students to only focus on the rewards instead of the knowledge. The motivational strategies are related to the teacher element, as the teacher is the one that will provide it to the students.

CONCLUSION

A conceptual framework of motivation towards serious games (WhysoSeriousGame) is proposed as in Figure 2. It is based on the motivation theories, the implementation of serious games in the classroom, and the improvement of the analysis of the previous frameworks. The components of this conceptual framework are based on the review of teaching and learning perspectives in combination with game implementation and motivation, aiming to establish a conceptual framework that will be useful for the teacher for efficient serious game implementation.

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