Factors Affecting Undergraduates’ Acceptance of Educational Game: An Application of Technology Acceptance Model (TAM)

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Abstract. Educational games (EG) are seen as a promising educational technology. This is due to fun and engaging nature of games compared to other media. However, little studies have been done to investigate factors that might affect student’s acceptance of EG, especially among undergraduate student. Understanding those factors can assist EG designers in designing better games. This study investigated those factors by applying modified technology acceptance model (TAM). Four (4) factors, namely usefulness, ease of use, attitude and learning opportunity were used. An online survey was done with 63 samples from Universiti Teknologi Malaysia. Data was analyzed using structural equation modeling (SEM) as well as descriptive method. Findings shown that usefulness, ease of use and attitude are significant acceptance factors of EG. Hopefully, this study will enrich literatures regarding EG acceptance factors especially among undergraduate students.

Keywords: educational games, user acceptance, unified theory of acceptance and use of technology (UTAUT), Visual Informatics.

1 Introduction

Educational games are regarded as future teaching and learning methods that better suits the preferences of younger generations, as reported by Federation of American Scientists (FAS), [1]. These generations grow up with internet, social networking programs, Sony Playstation (PS), online games, online videos, emails and so on are found to have different preferences in teaching and learning approach [2]. Therefore, integration of these technologies into their education seems to bring about positive effects.

Games are believed to have distinct advantages compared to conventional teaching and learning approach. Gee has proposed that it is able to teach 21st century skills such as problem solving, critical thinking, collaboration and team working [3]. From the perspective of rich games genre and design opportunities, EG developers have lots of opportunities to develop games based on learning outcomes and theories [4], [5], learning styles and learning domain [6], [7], [8].

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Many studies have been done to investigate EG effectiveness as a learning tool. Garris et al [6], have found that EGs are able to help student on various learning domains such as cognitive, affective as well as psychomotor skills. EG is also found to increase learning motivation as demonstrated in [9], [10], [11]. Motivation is among the most important element in learning, intrinsically or extrinsically. A study by Garzotto, [12] revealed that multiplayer online games provide learning benefits on affective level as well as knowledge domain. Other studies also acknowledged the benefits of using games for learning such as in [13], [14], [5] that stated game motivates learning, offer immediate feedback, support skills, and influences changes in behavior and attitudes.

With such promise, EG adoption, however, are still rather slow, Kebritchi [15]. Kebritchi suggested that there are need to investigate EG acceptance factors to further understand the reasons of low adoption rate of EG among schools despite its positive promise. She also stated that there are very much lacks of literatures discussing the matter. Similarly, De-Freitas [16] discussed the barriers for adoption of EG including i) familiarity with games-based software, ii) time to prepare effective game-based learning, iii) learners group who like to use this approach and, iv) cost associated with application. Therefore, we need to understand the factors that affects EG acceptance to help designers design better games.

This study seeks to investigate students’ acceptance factors of EG. It can assist EG designers to leverage the knowledge during the design process as well as for decision making process. Students are the most important stakeholders in education but often left with no choice when it comes to teaching and learning approach. It is happened both in school and institutes of higher learning (IHL). Thus, we choose undergraduate student as the samples. Besides, computer infrastructures are more accessible among them.

This paper is organized as follows: Section 2 discuss on theoretical background, followed by research model and hypotheses in section 3. Section 4 presents methodology while section 5 present results. Last section (6) is the conclusion.

2 Theoretical Background

2.1 Technology Acceptance

Dillon and Morris [17] defined user acceptance as “demonstrable willingness within a user group to employ information technology for the tasks it is designed to support”. It seeks to understand the contributing factors that affect users in deciding whether or not they will use a system. Those factors can be from both systems’ factors as well user’s factors. Systems factors are including its usefulness, easy to use, and enjoyment while users’ factors are about users’ background such as experience, attitude and resources that they have access. User acceptance inquires about why people accept a system so that better methods for design and development will be employed. It seeks to extend beyond usability studies that discussed about designing use friendly interface into much more deeper understanding about other factors contribute to user acceptance. User acceptance research seems to compliment usability studies by looking into wider