Chapter 18

Impact of Online Instructional Game Features on Students’ Perceived Motivational Support and Cognitive Investment

Angaliswaran Kumar  
University Malaysia Sabah, Malaysia

Kirthana Soundirapandian  
University Malaysia Sabah, Malaysia

Nor Huda Jaraime  
University Malaysia Sabah, Malaysia

Muralidharan Krishnan  
University Malaysia Sabah, Malaysia

Nurhafeezah Salwatul Alzah Juno  
University Malaysia Sabah, Malaysia

Nurfaaiqa Atiqa Samsudin  
University Malaysia Sabah, Malaysia

ABSTRACT

The purpose of this research is to study the relationship among Digital Game-Based Learning (DGBL) features on students’ perceived motivational support and cognitive investment. The research used a multiple regression for data analysis across a sample of 200 students in to a public higher learning institution in Federal Territory of Labuan Malaysia. Their participation was purely voluntary. Empirical analysis via multiple regressions confirmed that students’ perceived motivational support and cognitive investment was influenced positively by Digital Game-Based Learning (DGBL) features. The results may be used to inform higher education institutes students’ on how to design DGBL for the college students. How the DGBL works on college students’ perceived motivational support and cognitive investment. The results of this study offers a new forward motion to the findings of prior studies on develop a consolidated design model to consider all identified empirical relationships in order to support efficient DGBL in higher education.

INTRODUCTION

Digital game-based learning (DGBL) has become famous among college students to be used in various field such as education, entertainment, and military. The past studies by Entertainment Software Association (ESA, 2011) on DGBL clearly described that 72% of American households play DGBL on
computers or game consoles. 53% out of 72% of players are 18 until 45 years old who have experience of playing DGBL more than 12 years. There are excessive options in today’s technology world which help learners to reach the learning motive are broad. The DGBL is one of the opportunity to college students engage with technology society. Computer games one of the new learning environment that correspond better with students’ behaviour and concern (Prensky, 2001).

DGBL enhances critical thinking and improves college students’ commitment. The highest grow of it will be impact college students’ knowledge and skills form what DGBL provide in their system. DGBL has been identified for its capacity to motivate and engage learners cognitively, emotionally, and socially (Gee, 2003; Huang, Johnson, & Han, 2013; Prensky, 2001). During optimal experience, a person is in a psychological state where he or she is so involved with the goal driven activity that nothing else seem to matter. Past studies proves that the flow state have a positive effect on learning (Webster, Trevino, & Ryan, 1994) and should be considered when designing digital learning materials.

DGBL has the ability to offer many opportunities such as “learning by doing” as an interactive technology within the multimedia learning environment could foster learning process effectively and interestingly especially among the students (Pannese & Carlesi, 2007). The game features support the learners and it motivate the learner itself (Garris, Ahlers & Driskell, 2002). Despite the enormous potential of DGBL, it is still difficult to integrate games into curriculum of formal education. This is because of the difficulty in identifying their relevance to the students’ perceived motivational support and cognitive investment.

Advance technology could support multimedia learning environment. This study seek to understand specific game features factors to corresponding perceived motivational support and cognitive investment. Hence, the aim of this research is to examine:

1. The relationship among game features, learners’ perceived motivational support and cognitive investment based on Theory on Motivation, Violation, and Performance.
2. To identify the underlying principal factors of DGBL features in relation to their motivational as well as cognitive support.
3. To identify the features that can consolidate DGBL’s demand on college students’ motivational support and cognitive investment.

DGBL has potential to engage and motivate to student and also offer them practical experience. Previous research points out that DGBL has a significant potential to increase college students motivation learning (Papastergiou, 2009), and it will increases their learning effectiveness as DGBL also involve activities from completing very simple to hard task, and also for development of problem-solving skills. Cognitive load theory is the amount of mental energy needed to process an amount of particular information (Feinberg & Murphy, 2000). The important factor that influence the cognitive load is the number of elements that need to be attended to (Sweller, 1994).

The structure of this paper starts with the introduction that describes the background of the Digital game-based learning, followed by a review of literature in section 2. The paper than proceeds to discuss the methodology used in the study to carry out the survey, before analysing the resultant data. The final section contains the discussion and conclusion, consider the implications of the study and explain guidance for future research. DGBL’s demand on learners’ motivational support and cognitive processing capacity.