Transforming Classrooms through Game-Based Learning: A Feasibility Study in a Developing Country

Poonsri Vate-U-Lan, Graduate School of eLearning, Assumption University, Bangkok, Thailand

ABSTRACT

This article reports an exploratory study which investigated attitudes towards the practice of game-based learning in teaching STEM (science, technology, engineering and mathematics) within a Thai educational context. This self-administered Internet-based survey yielded 169 responses from a snowball sampling technique. Three fifths of respondents were female (59.2% or N=100 females and 40.8% or N=69 males). Slightly more than half (55.6%) of the participants were elementary, secondary and university students. An additional second group of thirty-five per cent (N=59) were teachers who were in charge of STEM educational programs. Almost one tenth (9.5%, N=16) were parents. Frequency tables were used to analyze the quantitative data. The qualitative data was derived from a single open-ended question. The study found some divergent opinions that are useful in considering game-based learning for STEM education in Thailand. The overall average attitude towards the usage of game-based learning was very positive (3.92 out of 5, S.D. = 0.80). The study found that the majority of informants preferred that the delivery mode was online through a web browser followed by the mobile mode through an application and the least preferred was the offline mode recorded on CD-ROM (55.0%, 31.4% and 13.6% respectively). That was still the most preferred language to be used though both students and parents surveyed had a stronger preference for English and a Thai-English bilingual mode than the teachers. An important finding in this research was that stakeholders expected game-based learning to be integrated into the traditional classroom because of its enhanced learning approach.

Keywords: Enhanced Learning, Game-Based Learning, Mathematics, Parents, Response, STEM Education, Students, Teacher, Technology

1. INTRODUCTION

Game-based learning (GBL) is claimed to be one of the best strategies to be implemented in the 21st century classroom. The objective of this current research was to explore how the three main stakeholders in the educational process, namely, teachers, students and parents, applied GBL to enhance the teaching of a new curriculum grouping, namely, science, technology, engineering and mathematics (STEM) education. A key focus of this research was GBL’s

DOI: 10.4018/ijgbl.2015010104
impact on the important aspects of increasing teacher, student and parent knowledge. Reeve (2013) stated that developing the specific skills of students as core foundations of STEM education. To remain globally competitive, Thailand’s educational authorities have called for increased studies in the fields of STEM education. The Special Initiative Project Division under the supervision of the Institute for the Promotion of Teaching Science and Technology (IPST) supports the allocation of grants to underpin the development of strategic plans, conducting professional development initiatives, encouraging STEM activities and developing materials for both formal and informal education (Waitayangkoon, 2014). Digital game-based learning (DGBL) has become more common in Thai society with the capacity for delivery through multiple forms of computer devices available to students and people of all ages. Accordingly, it seems appropriate and even necessary, to explore stakeholder perceptions towards DGBL and its potential to boost educational engagement with the Thai STEM curriculum.

In order to transform classrooms through blending DGBL into teaching STEM in Thailand effectively, it has been found that many aspects require increased knowledge and clarification. Increased knowledge needed in: 1) formulating design strategies that balance the motivational elements of creativity that captivate students’ propensity to “play”, thus satisfying curriculum objectives; 2) integrating DGBL into the classroom learning experience focused around how to use games; and 3) leveraging collaboration across the education sector. It is important to note that STEM education is being taught already but research of STEM education using DGBL in Thailand is very limited. However, guidelines for DGBL initiatives remain scarce. Therefore, the research objective of this study was to conduct an online survey to explore the range of issues outlined above with teachers teaching the STEM curriculum using DGBL, the students being taught aided by DGBL as well as parental attitudes towards DGBL.

2. LITERATURE REVIEW

Disruptive technology has become a real phenomenon not only in developing and developed countries. People, particularly children and adolescents, have more opportunities to engage in new digital literacy practices, especially playing digital games on mobile devices as the price of these “gadgets” has become ever cheaper has vastly reduced. According to the International Telecommunication Union (2013) and Silicon India (2013) in 2014, the world will have more cell phone accounts than people on earth (7.3 billion accounts for 7.1 billion people). In 2013, two fifths (41%) of the world’s households were connected to the Internet (International Telecommunication Union, 2013). In the developed world, 78 per cent of all households are connected to the Internet (International Telecommunication Union, 2013). The highest levels of household Internet penetration is the European region (87%) whereas the lowest levels occur in the African region (7%) (International Telecommunication Union, 2013). The profile of online entertainment and games in Thailand is similar to the U.S.A. where games have been the most popular mobile phone application followed by social networking - 64% and 56% respectively (International Telecommunication Union, 2011).

The Internet will definitely be a part of the core education infrastructure in Thailand. Under Thai government policy for the 3G network that is currently being implemented, the number of Internet users in Thailand was expected to reach 52 million by the end of 2013, an estimated 74.3 per cent of Thailand’s total population that is approaching 70 million people (Williams, 2013). A staggering 865,090 tablets have been distributed in the ‘One Tablet per Child Project’ by the Thai government (One Tablet per Child Project of Thailand, 2012). The objective of this program was to support first-grade students who are generally six or seven years of age, in having a device to achieve two objectives: 1) to provide education opportunity and equality for all and
Game Jams: Community, Motivations, and Learning among Jammers
www.igi-global.com/article/game-jams-community-motivations-learning/69785?camid=4v1a