GAMIFICATION AND MOTIVATION: A PRELIMINARY SURVEY

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ABSTRACT

Nowadays, computer/video games are increasingly becoming part of the daily activities of students of all ages. Computer/video games have also been shown to support student motivation and learning. In order to effectively gamify learning, educators need to understand the related aspects regarding games, motivational psychology and also pedagogy. This paper discusses a number of different approaches employed in gamification in terms of motivational psychology and pedagogy. The first section introduces on motivational factors that affect learning and also behavioral change among learners. The second section elaborates on a case study done to investigate the students’ interest and opinions towards computer/video game. The final section of the paper concludes with a paragraph that proposed pedagogical strategies when implementing gamification as an education tool.

Keywords: Education; gamification; motivation; theories.
1.0 INTRODUCTION

MCMC's Handphone Users Survey 2014 indicated that people aged 15 to 29 made up almost 56.8% of smartphone users in Malaysia. In addition, two thirds of the respondents involved in the MCMC’s 2014 study also have access to the Internet. The scenario showed that today’s learners are technology savvy and expect to be engaged. Most learners, especially in the Higher Education Institutions (HEI), are comfortable using computers and expect the use of computers as part of their learning process. In addition, several studies (such as Muniandy, 2010; Teong, 2016; Ayub, 2014) had agreed on the fact that Malaysian HEI learners spend a major portion of their time in accessing the Internet (for academic and extracurricular purposes).

The advancement of Internet usage in classroom sparked the use of computer/video game as an optional learning instruction. Having the sense of control by being able to influence the course of events, and the direct relationship between learners’ actions with the outcome engage the learners to choose computer/video games. Nowadays, it is becoming increasingly difficult to ignore the fact that computer/video games are the contemporary culture of youths. Consequently, the Newzoo’s Summer Series Report (No.23) mentioned a staggering amount of 14.9 million Malaysian gamers in 2015. Young adults are particularly likely to play computer/video games, as well as to identify as “gamers.” According to a survey conducted by Pew Internet Project in 2015, more than half adults (67%) between the ages of 18 to 29 confess to playing computer/video games.

A game can be seen as a system in which players engage in an abstract challenge defined by sets of rules, interactivity, and feedback that results in a quantifiable outcome and often elicits an emotional reaction (Koster, 2013). While the educational computer game represents a technology-supported game that is intended to result in a desirable change in the player's knowledge (Goehle, 2013; Mayer & Johnson, 2010). These educational games have dual purposed. Primarily it is a game, and secondly to teach something (Goehle, 2013). This perspective, known as game-based learning focused more on utilizing the game as a medium to convey the learning contents (Conati, 2002). In the same vein, Pedersen (2009) defined educational (serious) games as games that emphasize on learning. The newest addition of games in education is called gamification. According to Deterding, Dixon, Khaled, & Nacke (2011), gamification is “the use of game design elements in non-game contexts”. Thus, indicating that
gamified systems are not full-fledged games as they use only some elements of game design and also do not belong to the classical context of games.

Generally, each learner is different in terms of needs and aims. Personalized learning is all about providing personalized interventions focused on the individual needs of the learner. This personalization also provides the learner with a sense of control over their learning progress. Looking back into the history of games in education through the ascending use of computer/video games approaches expressed an increasing desire for control among learners. Good computer/video games provide challenges that match the skills of the player. The state of being deeply engaged in a computer/video game based on the difficulty that matches the learners’ current ability has been termed “Flow” (Csikszentmihalyi & Rathunde, 1993). Flow shares some characteristics with personalized learning. Flow matches the actions of the system with the specific state of the individual in achieving the goals and objectives of personalized learning. But how would gamification achieve this? One potentially vital element to be considered is motivation.

As such, the purpose of this study is to determine learners’ perceived opinions on computer/video games. These opinions will justify the importance of utilizing motivational theories in the learning process that applies computer/video games. The paper is structured as follows; the first section introduces on motivational theories that affect learning and behavioral change among learners. The second section elaborates on a case study done to investigate the students’ interest towards computer/video game usage. The final section of the paper concludes with a discussion and conclusion that proposed pedagogical strategies and also points towards areas of future study in gamification.

2.0 MOTIVATIONAL THEORIES TO UNDERSTAND GAMIFICATION

Motivation is an internal drive. According to Moos & Marroquin (2010), motivation corresponds to physiological processes that influence the directions and persistence of learners’ behaviours. Thus, we can say that motivation is the force that causes individual in our case the learner to act or to do something and to continue doing it. Motivation plays an important role especially when interacting with a digital system (Jung, Schneider, & Valacich, 2010). This is especially true since computer/video games are digital activities intended to be fun and learners should want to
learn. Learners play games for the experience being created (Lazzaro, 2009). Nevertheless, Wyeth, Johnson, & Sweetser (2012) claimed that the experience of being entertained through games is not yet well understood especially from a psychological perspective. In addition, an article by Sinha (2012) in Huffington Post also argued that most learners lose their enthusiasm in learning due to the inadequately designed motivation scheme utilized in educational tools.

Generally, most people divide motivation into two camps – intrinsic and extrinsic (Ryan & Deci, 2000). In simple terms, intrinsic motivation is an innate drive to do something. While extrinsic motivation pushes you to do something because of an external reward or punishment. The aim of this paper is to examine gamification from the perspective of Maslow’s hierarchy of needs theory, Skinner’s reinforcement theory and the flow theory. All concepts will be introduced in the next section by providing the theoretical background to understand them.

2.1 Maslow’s Hierarchy of Needs Theory

Maslow’s hierarchy of needs is a suitable model to examine before mapping game principles to motivational theory. Maslow suggested that individuals have a hierarchy of needs and that each need must be addressed and fulfilled sequentially if the individual is to become self-actualized. The four lower levels (lower-order needs) are considered physiological needs, while the top level of the pyramid is considered growth needs (refer to Figure 1).

![Figure 1. Maslow’s Hierarchy of Needs Theory](http://simplypsychology.com)
Human behaviors are driven by their desire to satisfy both physical and psychological needs. According to a book entitled “Drive: The Surprising Truth about What Motivates Us” the writer posits that the modern society populations are commonly satisfied with the four lower levels of the Maslow’s hierarchy. In addition, the modern society learners also turn out to be much more motivated by other intrinsic motivators. The aforementioned author focused on three intrinsic motivator; autonomy, mastery and purpose (Pink, 2009). Remarkably, these intrinsic motivators were also mentioned by Maslow as the meta-motivators in his self-actualization level. Consequently, the Maslow’s theory outlines about what learners need, and these needs are what motivate learners. As such, in order for gamification to work, educators or educational institutions need to first consider the learners’ needs as this is the source of their motivation.

2.2 Skinner’s Reinforcement Theory
The theory is actually a full behavior model which claims that human behavior is a result of the cumulative effects of environmental reinforcements and learning. According to the reinforcement theory (Skinner, 1976), the change in the learners’ attitudes and behaviors is learned by operant conditioning, where the consequences of humans’ actions modify the tendency to repeat a behavior. Skinner’s theory is different from the Maslow’s theory as the former disregards innate needs and uses only external conditions/reinforcement to manipulate and shape people’s behavior. As such, the theory posits that conditioned reinforcements are learned, and they become the motivator. Skinner’s theory outlines the effects of many different types of reward schedules on the response rate of the learner and what actions each type of schedule helps invoke. In addition, the theory also induced that learners can be conditioned to obtain certain motivation. In this vain, gamified educational tools should be designed with sufficient game mechanics and game dynamics to condition the learners along their learning process.

2.3 The Flow Theory
The theory characterized a mental state and was developed by Csikszentmihalyi, a renowned psychologist in 1975. Flow is an optimal state of intrinsic motivation, where learners become totally immersed in what they are doing. Learners experiencing flow often forget about physical feelings, the passing of time, and diminish their ego. Although the flow is an extremely desirable mental state, it is not easy to get into the state of flow. Part of the reason is because there is an inherent discordance in what learners want.
Most learners love to be in the control state, because it gives them a sense of security and safety. But equivalently, they also hate boredom. However, in time, as learners acquire skills, they unconsciously move into the boredom state. Thus, learners require some kind of new challenging tasks on timely basis. In real life, this often pushes learners into the excitement state, because it is usually very hard to find tasks with the right level of challenge that match learners’ skills exactly. They are either far too easy or too hard. So the apparent paradox of human motivation is really our attempt to find that fine line between certain and uncertainty. In the perspective of gamification, the flow theory is thus the theory that balances between the two previous theories. Recklessly giving learners points is not going to work over the long term, because this resulted in learners getting tired and bored rather quickly.

3.0 THE STUDY

3.1 Material and Method
A quantitatively based method was chosen as the blueprint in this study which focuses on exploratory research. Questionnaire is used as the main data collection method for this study. This section describes on the sample chosen, selected survey instrument, data collection procedures and analysis methods used to analyse the gathered data.

3.2 Participants
A total of 124 valid respondents (n = 124), from a selected private university in Malaysia took part in the survey. The respondents consist of final year undergraduate students from the science and information technology faculty in the private university. The faculty is chosen for two reasons; the first is that the faculty is mirrored as a technical faculty that had more courses and subjects that deal with practical-based and laboratory activities. The second reason is that these students has completed their at least 60 credit hours of learning therefore they have the experience in giving opinions on their prior/current exposure to computer/video games. Before the survey, the respondents were informed about the purpose of the survey, how the survey being carried out and the important definitions of few terms used in the study. Among the participants, 81 (65.3%) of them were male while the rest were female.

3.3 Survey Instrument
The questionnaire consists of four major sections part A, part B, part C and part D. Part A and part B both gathered information on respondent’s demographic information and also information
regarding the respondents’ previous exposure and habits in terms of computer/video games. While part C consists of five items to collect respondent’s interest regarding computer/video games. Lastly, part D consists of ten items to gather respondent’s opinion on computer/video games. Both part C and D are measured using a likert scale from 1 to 5 (1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree) options. This study adopted and enhanced the questionnaire from Mohamed, Jan, & Daud (2010).

3.4 Data Collection Procedure and Analysis
A total of 200 questionnaires were manually distributed to the participants. Only 130 questionnaires was successfully returned back and a total of 124 responses were identified as valid response being analyzed. In order to identify the reliability each of the construct used, Cronbach-Alpha test was implemented.

Findings from the Cronbach's Alpha value for all the variables reflected as acceptable (above .70). This reflects very good internal consistency reliability among the items for each of the construct. This shows that the constructs used to measure part C and part D in this study are reliable. Table 1 presents the Cronbach-Alpha value and number of items for each of the construct.

<table>
<thead>
<tr>
<th>Part (Component)</th>
<th>Cronbach-Alpha</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part C (Interest regarding computer/video games)</td>
<td>0.757</td>
<td>5</td>
</tr>
<tr>
<td>Part D (Opinion on computer/video games)</td>
<td>0.766</td>
<td>10</td>
</tr>
</tbody>
</table>

In terms of interest regarding computer/video game, the results uncover that majority of the learners agree that they like to play and try new computer/video games. The learners also agreed on the point of not being able to control their time allocation while playing computer/video game. However, the respondents have mixed opinions in terms of their interest in spending most of their daily time playing computer/video games. Table 2 illustrated the mean and standard deviation of the items for respondents’ interest regarding computer/video games.
Table 2: Descriptive Results for Part C

<table>
<thead>
<tr>
<th>Part C (Interest regarding computer/video games)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 I like to play computer/video games</td>
<td>3.89</td>
<td>0.84</td>
</tr>
<tr>
<td>C2 I like to spend most of my time playing computer/video games</td>
<td>2.97</td>
<td>0.83</td>
</tr>
<tr>
<td>C3 I do not realize how time goes by while playing computer/video games</td>
<td>3.22</td>
<td>0.93</td>
</tr>
<tr>
<td>C4 If possible I want to play computer/video games everyday</td>
<td>2.87</td>
<td>1.06</td>
</tr>
<tr>
<td>C5 I like to try out new computer/video games</td>
<td>3.67</td>
<td>0.99</td>
</tr>
<tr>
<td>Total</td>
<td>3.32</td>
<td>0.67</td>
</tr>
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</table>

Further analyzing the respondents’ opinion regarding the computer/video games, the majority of the respondents do once again agree that computer/video games can help them to better elevate their critical and logical thinking, increase knowledge on computers, and increase their results regarding computer subjects. Not surprisingly, the highest mean was obtained from the respondents on the item regarding the use of computer/video game to reduce their stress level. Five items received mixed results, the items were related to computer/video games being more beneficial than other leisure activities, the ability of computer/video games to help respondents get good results in programming/multimedia subjects, the ability of computer/video game to decrease the respondents’ academic performance, the ability of computer/video game to hinder respondents’ from gaining friends and finally, the prospect of computer/video game to make the respondents into passive learners. Table 3 show the mean and standard deviation of the items for opinions on computer/video games.

Table 3: Descriptive Results for Part D

<table>
<thead>
<tr>
<th>Part D (Opinion on computer/video games)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1 Playing computer/video games will help me</td>
<td>3.19</td>
<td>0.93</td>
</tr>
<tr>
<td>D2 Playing computer/video games will increase my critical and logical thinking</td>
<td>3.75</td>
<td>0.80</td>
</tr>
<tr>
<td>D3 Playing computer/video games will increase my knowledge on computers</td>
<td>3.66</td>
<td>0.83</td>
</tr>
<tr>
<td>D4 Playing computer/video games will help me release stress</td>
<td>4.00</td>
<td>0.81</td>
</tr>
<tr>
<td>D5 Playing computer/video games is more beneficial than other leisure activities</td>
<td>2.96</td>
<td>0.88</td>
</tr>
<tr>
<td>D6 Playing computer/video games helps me get good results in programming/multimedia subjects</td>
<td>2.96</td>
<td>0.91</td>
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<tr>
<td>D7</td>
<td>Playing computer/video games will help me get good results in computer subjects</td>
<td>3.04</td>
</tr>
<tr>
<td>D8</td>
<td>My academic performance will decrease because I play computer/video game</td>
<td>2.98</td>
</tr>
<tr>
<td>D9</td>
<td>I do not have many friends because of computer/video games</td>
<td>2.26</td>
</tr>
<tr>
<td>D10</td>
<td>Playing computer/video games makes me passive</td>
<td>2.90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.17</strong></td>
<td><strong>0.51</strong></td>
</tr>
</tbody>
</table>

### 4.0 DISCUSSION

Gamification is the approach the uses game features into non-game activities to motivate or influence learners’ behavior. In the educational field, this emerging discipline although being at the intersection of issues such as superficial student engagement (Dominguez, Saenz-de-Navarrete, de-Marcos, Fernandez-Sanz, Pages, & Martínez-Herráiz, 2013) is still growing dramatically. From the perspectives of product designers, industrial strategists and marketing executives, motivational theory is just intuitive – any products, brands and experiences is simply designed to match innate consumer needs.

However, the educational perspective demands educators or educational institutions to investigate a bit deeper where gamification is concerned. As a result, good gamification design needs to understand and align the learning objectives with a learner’s intrinsic motivation. Then, through the use of extrinsic rewards and intrinsically satisfying design, move the learner through their own journey of mastery. Generally, the two building blocks of gamification are the game mechanics and the game dynamics. Both are interrelated in a sense that game mechanics acts as the agents, objects, elements and relationships while the game dynamics is the outcome that resulted from the motivational nature of the experience. Thus, the better the gamification flows, the more likely learners are to internalize and take ownership of the process. This is where motivation plays a role.

The gen Y or millennial learners showed an overall high positive interest on the idea of using computer/video game. This finding is in line with the research report by the Entertainment Software Association (ESA) which revealed the 18-35 years age group as the biggest user of computer/video game at 29%. However, the mixed opinion on time allocation preference suggests that one of the important factors in this situation that can influence; either enhance or
diminish the ability of a gamified learning objective to affect learners’ performance is the ability of the learners themselves. In this context, ability does not always denote skills. Ability can be time, attention, mental capacity, or any rare resources that the learner might need to complete their own journey of mastery.

In addition, the gen Y or millennial learners also portray a positive opinion towards using computer/video game as an educational tool. These learners undoubtedly perceived computer/video games as the prescription to relive stress, reduce depression, and make them feel better. This may sound like a big claim but there exists plenty of evidence available to support it (such as Collins & Cox, 2014; Ferguson & Rueda, 2010). Accordingly, the study obtained mixed opinions from five items which suggested the gen Y or millennial learners need to be in control over their own learning environment. Consequently, they had a preference to empower their own learning goals and become the creators of their learning.

5.0 CONCLUSION

The gen Y or millennial learners have arrived and are here in our educational system. Generally, each generation of learners immersed with varying characteristics that distinguish them from their predecessors. According to the findings, a paradigm shift is occurring, and educators or educational institutions cannot ignore the needs of these millennials through their own journey of mastery. For these millennial learners, gamification is just a medium to obtain mastery and mastery demands deep learning. However, educators or educational institutions seldom make a mistake by thinking of deep learning as something that only some learners obtain at the end. In reality, deep learning is what happens along the way if the opportunities allow the learners to.

In terms of using gamification as educational tools, educators or educational institutions need to consider two shifts; the first being to plan the whole gamification experience carefully beforehand. The second shift is for educators or educational institutions to replicate these strategies in the gamification building blocks: 1) providing millennials numerous opportunities to be actively engaged, 2) intrinsically motivate them, 3) providing them time to practice and instant feedback with appropriately diminishing support, 4) empowering the millennials with means to organize their own thinking and put the new knowledge into their existing frameworks, and also 5) providing adequate time for the millennials to attain personal reflection and adjustment. The motivational theories discussed will offer additional designs considerations in
planning the gamification experience and also for implementing these strategies into gamification.

Finally, according to Laskaris (2014), learners remember 10% of what they read, 20% of what they hear, the number rises to 30% if there are visuals accompanying an oral presentation, if they were to observe someone carrying out an action while explaining it, then they remember 50%, however, if learners do the job themselves, even if only a simulation, then they remember 90% of what they learned. This is the basis of why the paper focused on using gamification. As an educational tool, gamification allows the learners to achieve the learning tasks to obtain mastery at their own pace while being fun and enjoyable. However, the aforementioned and suggested gamification issues such as deep learning and educational shifts demands further studies. Hopefully, this on-going study will help provide some insight into gamification design motivation especially for the local education setting.
REFERENCES


