GAMIFICATION; CHALLENGES TO TRANSCEND BEYOND ONLINE EDUCATION INTO THE 21ST CENTURY CLASSROOM

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ABSTRACT

Gamification, the use of game elements in non-gaming context has transcended beyond the reach of virtual classroom, into the real world. The existence of elements such as badges and leaderboard in classroom activities as well as its similarities seen in social networks and virtual learning environments; has exposed gamification to a wider audience in the past few years. Although its initial intention was to attract more usage and participation, the acceptance factors has varied based on the needs of users. The users' needs can be measured based on their game personality traits; that changes based on the challenges put forth to them. Beyond that, the existence and familiarity towards using technology also plays a key part in promoting gamification in learning. Furthermore, the perception of people towards gamification and its use in education needs to be considered thoroughly to ensure a sustainable learning process that expands beyond the school environment into the homes of the students. Besides that, gamification has been proven to be successful in using extrinsic motivational factor to attract the users, yet the extent of its effects on the intrinsic motivation depends on whether the intervention is deemed meaningful or meaningless by its users. Therefore, based on the literary findings, tackling the challenges to implement gamification will depend on acknowledging the game elements, the difference in student game personality traits as well as the perceived motivation type that exists in a student.

Keywords: Gamification, Game elements, classroom

INTRODUCTION

Gamification, the use of game elements in non-gaming context (Deterding, Dixon, Khaled, & Nacke, 2011; Deterding, Dixon, Sicart, Nacke, & O'Hara, 2011; Zichermann & Cunningham, 2011), has seen positive impact in enforcing the needs of the system by manipulating the interest level of the users. For example, games kept the users engaged with its scoring systems that may involve points, badges or going up a level, whilst the same concept was introduced into real life situations such as airline royalty points, Starbucks purchase digital badges (Huotari & Hamari, 2012; Xu, Weber, & Buhalis, 2013)or even in day to day simple business ventures such as car wash, where the customers are rewarded for their royalty of frequenting to their business. This form of game elements acted as a form of automatic marketing and advertising ploy for the business.

Although gamification already existed in the education field (Becker & Nicholson, 2016; J. J. Lee & Hammer, 2011) via points that were rewarded based on the student's achievement in exams, badges retrieved via co-curriculum activities such as scouts or girl guides and leaderboard seen in the ranking system after every examination sessions in a school. Meanwhile in the field of e-learning, the existence of tasks completion badges and level ups has extended the use of gamification into the virtual learning environment(Barata, Gama, Jorge, & Gonçalves, 2011; Li, Dong, Untch, & Chasteen, 2013; Sanmugam et al., 2014). Yet, the extent of the gamification power that enchants users in the commercial field to come back for more has not been seen in the education field. This is vital as the 21st century education needs not only the online based education but also into the traditional lessons of the students. Therefore, it is important in identifying the obstacles that one may face before implementing a gamified learning method onto the students.

CHALLENGES IN A GAMIFIED EDUCATION

In creating a gamified education system that is meaningful for the users as well as interesting enough to re-attract them back; it is vital to understand and identify the challenges that exists. These include the elements, motivational factors and participatory factors of the users.

Several gamification researches were analyzed to identify the challenges faced by the researchers.

Table 1 Gamification Research Analysis

Research	Findings	Discussion
A User-Centered Theoretical Framework for Meaningful Gamification by Nicholson, (2012a)	Identified that meaningful gamification can be attained through user-centric activities	A meaningful gamification happens when goals, objectives and needs of the participants or users supersede the requirements placed by an organization. Focusing only on the game mechanics creates a false scenario in achieving a goal.
Play As You Learn : Gamification as a Technique for Motivating	Discussed about examples of gamification usage outside the norms of education and how it	A learning activity, gamification should be done and planned at the same stage. Rewards need to be achievable to push up the

Learners by Glover, (2013).	can be implemented via e-learning.	motivation level, yet limited.

Research	Findings	Discussion
Khan academy gamifies computer science by Morrison and DiSalvo, (2014)	Addresses the issues of short-term engagement and keeping users involved and progressing to more difficult tasks.	Although Khan Academy included gaming elements, it has not managed to create desired motivational effect. Therefore, successful implementation can be achieved by altering the badges and points system by allowing more well-defined goals and expanding the social aspects of the gaming elements.
Gamification for low-literates Effects on motivation , user experience , and study design by Schouten *et al.* (2011)	Although quantitative results were not significant; the qualitative finding showed limited levels of effectiveness. This was due to the complex questionnaires and a meaningless form of gamification elements.	It was found that gamification was ineffective to these participants as they were overwhelmed with the complex questions, tasks and scoring system that they did not understand. This shows that the main tasks must suit the participants to ensure they can understand and enjoy the gamification elements. Failing at the first hurdle creates a domino effect that makes features such as hints not used by the users.
Gamifying learning experiences : Practical implications and outcomes by Domínguez, A et al. (2013)	Advancement within the online learning experience were emboldened by the rewards system; for instance, the competitive aspect among students created by the leader board.	Despite the reward system, fun was lacking in the learning experience. There was lacking interest in going up the leader boards as it did not consider the needs of the users, instead the need of the organization.
In-Game Assessments Increase Novice Programmers' Engagement and Level Completion Speed by Lee *et al.* (2013)	The learners completed more levels, played the game longer, and were faster in regular levels when given assessments.	Assessment being infused in a manner of narrative helped keeping users engaged and kept them in the flow.
CodeSpells : Embodying the Metaphor of Wizardry for Programming by Esper, Foster, & Griswold, (2013)	Increased engagement through the spell mechanism creates authenticity.	Intrinsic motivation was invoked as the participants felt the need to redo the tasks they were unsuccessful in as it was vital in progressing to the next stage in the game.
Research	Findings	Discussion
Engaging Engineering Students with Gamification An empirical study by Barata, Gama, Jorge, & Gonçalves, (2013)	Engagement improved via the course attendance and the number of posts yet there was no improvement in grades. The creation of an online persona or "Avatar" was suggested by the students; as well as the need for group tasks.	No improvement due to the notion of meaningless gamification. Highlighted the need for achievement stages, online identity and group related tasks.
Motivation of Learning: An Assessment of The Practicality and Effectiveness of Gamification Within a Tertiary Education by Ong, Yeng, Hong, & Young, (2013)	There was mild positive general response from students, it shows that gamification, being independent of past gaming experience and personality/learning style is practical and effective among all students when applied in Malaysia.	This research was only carried out based on past gaming experiences. Though the positive response shows that gamification can be used in the field of education in Malaysia. No hands-on activities on gamification were carried out with the students.
Gamification-based assessment of group work by Moccozet *et al.*(2013)	The social interaction based gamification allowed the students to collaborate with their peers.	This researcher managed to come up with a framework to tackle with free-rider in a group and the added task of peer assessment. The integration of additional gamification components should also be investigated such as badges, and should be taken into consideration in creating a gamified environment.
An Experience Report on Using Gamification in Technical Higher Education by Epema and Iosup, (2014)	Increased passing rate was related to the participation levels in the assignments.	Students were attracted to the design of the course as well as the gamification elements in it. Though the use of Richard Bartle's player motivation catered to different student's skill, yet there was discrepancy between the elements of winners and achievers. Winners renamed from

Research	Findings	Discussion
		killers, seemed to suggest the same path as achievers as both are deemed to have the tendency to do their best to be the best. Besides that, the researchers also did not discuss which player motivation succeeded or showed the most improvement.
A multilevel analysis of the effects of external rewards on elementary students' motivation, engagement and learning in an educational game by Filsecker and Hickey, (2014)	The results showed that there were no significant differences for motivation level and engagement between control group and the gamified group. When it came to learning, those in the gamified users fared better than the control group. In aspects of external rewards, it was found that there was no significance when it came to its effect on the student's motivation and interest. In terms of learning, there was a positive effect.	Therefore, when it came to external rewards in a technology enhanced environment has a positive effect on learning without having any negative consequences for motivation; as predicted by cognitive evaluation theory. Contradicting with other findings of gamification that states of improvement in motivation and engagement
Interaction and Reflection with Quantified Self and Gamification: an Experimental Study by Morschheuser *et al.* (2014)	Perceived fun has a positive effect on the motivation and the motivation to use the application with gamification is significantly higher than for the application without it.	The research showed that gamification promoted motivation and social interaction among students. Feedback also allowed interaction among students that will also allow the lecturer to correct himself. The only setback was that there was a low participation rate among the students.
Effects of Gamification on Lower Secondary School Students' Motivation and Engagement by Hong and Masood, (2014)	The findings showed that students from the gamified classroom fared better for intrinsic motivation in learning. Although there was only a marginal difference in engagement levels, the gamified learning has the potential in improving the engagement levels.	Gamification in the context of Malaysian school; managed to improve the motivation levels of students significantly. Yet there was no difference in engagement levels as the teacher-student interaction played a key part in this aspect.

Based on these findings, several challenges needed to transcend gamification into education were successfully identified; most notably the type of game elements, existence of player types, motivational aspects as well as student participation.

GAMIFICATION, GAME ELEMENTS AND PLAYER TYPES
Game elements exists in different forms and factors; via points, badges, levels and leaderboards that is an integral part of the system mechanics or avatars that act as a cosmetic part of the gamified system. The usage of game elements will depend on the type of system or environment its infused into (Dixon, 2011). The correct balance between the elements is vital to ensure the gamification elements are deemed meaningful and worth trying for (Nicholson, 2012b; Sanmugam, Abdullah, & Zaid, 2015). Earning points, badges and climbing up the leaderboard should be worthwhile and must not get boring (Mekler, Brühlmann, Opwis, & Tuch, 2013; Shaffer, Squire, Halverson, & Gee, 2005). It must be a reward in accomplishing something worthwhile in the game. Whilst game elements such as avatar helps users create an online persona that relates them to the system(Annetta, Minogue, Holmes, & Cheng, 2009). Though these apply only to online based gamification, the avatar form can be created in traditional classroom by role playing activities and allow the students to choose their character that represents them; example warriors, wizard or the king (Richards, 2013).

Yet, according of game elements needs to go in line with the needs of the users and the changes that happen throughout the journey of completing the tasks in the system. For example, according to Bartle, (1996) and Dixon, (2011), there a four types of game players, Achievers, Killers, Socializers and Explorers. Achievers are players whom play the game to achieve something; high score or game completion, Killers are players whom play to dominate other players, Socializers are players who participate to find acquaintances and friends in the game and Explorers who play to explore and immerse themselves in the mechanics and gameplay of the game. Despite the initial existence of these player types in each individuals, according to Bovaird, (2016) and Charles, Kerr, & McNeill, (2005) that the player types changes based on the type of games and objectives of the games. Thus, any gamified system should be adaptive towards the needs of the users instead of setting up a system and assuming that it suits all types of users. This will allow the students to find the path that suits their personality and needs; but at the same time guide the students to achieve the intended learning goals.

EXTRINSIC VERSUS INTRINSIC MOTIVATION

The usage of rewards in a gamified system acts a form of extrinsic motivators that is intended to activate the intrinsic motivation of the users. This is important as when the intrinsic motivation exists the users will carry out a task based on the internal needs of the users instead of the external factors that exists in the system. As stated by Crowley, Breslin, Corcoran, & Young, (2012) based on McAuley, Duncan, & Tammen, (1989) and Vansteenkiste, Lens, & Deci, (2006) the existence of intrinsic motivation allows an autonomous form of reaction from the users. Yet, the infusion of extrinsic motivators must be done systematically to ensure that the extrinsic motivators doesn't overshadow the intrinsic motivation of the users. This will lead to a dangerous precedence of which, the task will only be carried out based on the type of reward given and not for the fun of the task itself (Deterding, 2011).

Besides that, identifying the type of motivators that suit the type of users is key in ensuring the cultivation of intrinsic motivation. For example, those within the achievers' player motivation will be happy to achieve points and going up the leaderboard (Christy & Fox, 2014), whilst the explorers will be happy with game elements that represents their exploration of the system (Schoenau-Fog & Henrik, 2014); for instance special badges rewarded for the completion percentage.

Therefore, gamification needs to be infused into the way that can educate the students (Nicholson, 2012b). Using an interesting; technology based platform, this research hopes to take the word of assessment out the minds of the students and make it into play, something fun to do (Arnold, 2014; Barata, Gama, Jorge, & Goncalves, 2013; Sanmugam, Zaid, et al., 2015). Using the fun factor, one can ensure that the assessment get done, and at the pace of the student's capabilities. In this way, the students challenge only themselves, with no distraction of grades and failing the subject.

PARTICIPATION

Engagement is the process of partaking and participating in an activity with commitment, enthusiasm, dedication and energy (Schaufeli, 2013). When considering the success of a e-learning method, especially involving games, engagement plays an important role as it acts as the benchmark (Muntean, 2011; Schoenau-Fog & Henrik, 2014). The engagement levels of the users reveal to the educators or creators of the system whether the users are attached to the system introduced to them. Engagements can be accessed on three aspects: behavioural engagement, emotional engagement, and cognitive engagement (Birch & Ladd, 1997). The behavioural engagement involves students participating in an activity to fulfil the requirement of the tasks. Emotional engagement relates the feelings or needs a student has towards the activity. Cognitive engagement refers to an attachment towards an activity to gain knowledge (Birch & Ladd, 1997; Fredricks, Blumenfeld, & Paris, 2004). This is in line with the Engagement Theory (Kearsley & Shneiderman, 1998) that emphasizes that students must be meaningfully engaged in learning activities through interaction with others and worthwhile tasks.

With reference to learning activities, Hamari et al., (2016) found that engagement can be triggered with challenging activities as it keeps the users attracted and wanting for more. Rowe, Shores, Mott, & Lester, (2011) found that students' background into a knowledge base as well as a game like experience can influence students' engagement levels towards an activity. This was supported by Dede, (2009) who stated that with a game like experience, the users will reach a state of optimal level of engagement, leading to feeling immersed in the system. This shows that activities that challenge the intellectual level of students encourage the participation of users. The activities in a game like environment can also help in promoting engagement levels in learning among students. This can be related to the fact that the current batch of students are from the Gen-Z batch (Rothman, 2014) or the generation known as the digital natives (Eck, 2006; Prensky, 2001; Thompson, 2013).

Jang, (2008) found that an engaging learning platform alone is not enough to cultivate engagement among students, instead there is a need to enforce the rationale behind running such tasks as well as supporting the tasks with extrinsic motivation elements. Besides that, Annetta et al., (2009) pointed out that even high levels of engagement created by a game like experience in learning does not guarantee improvement in students' achievement levels. This creates a gap that needs to be considered when it comes to learning. As a combination of engagement towards learning, the need to improve achievement levels of the students' needs to work concurrently to ensure a meaningful learning process.

CONCLUSION

Based on the challenges identified, it can be concluded that to ensure the gamified education to transcend beyond just online classroom, identifying the type of game elements that suits the users of the system is vital. A game element assigned to a gamified learning without taking into consideration of the player motivational types or user player traits will lead to a form of meaningless gamification. Identifying the player traits can be done either by using the initial player motivations scales by Bartle, (1996) or other updated player traits scales (Bostan, 2010; Charles et al., 2005; Dixon, 2011) available now. Besides that, creating a balance between the extrinsic motivation and intrinsic motivation will allow the gamified learning system to be appreciated and used for its initial purpose instead of being used just based on the existence of external rewards. It was also identified that to ensure user engagement to the gamified system, creation of challenges as well as making these tasks fun can cultivate the participation level of the users towards the system. When it comes to the Asian/Malaysian levels of Gamification concept, based on the finding of Ong, Yeng, Hong, & Young, (2013), theoretical success is guaranteed based on the background of students in video games that will nurture the success of gamification. This was supported also by Hong & Masood, (2014); Sanmugam, Zaid, et al., (2015) whom found that implementing gamification in education is feasible but needs to be carried out by bridging the link between the traditional and online classroom. Thus, creating a generic gamified learning environment loosely based on game elements will fail, if one does not take into the account the needs and the characters of the system users.

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250