

Gamification: A Look into the Game Elements that Drive Towards a Meaningful Teaching and Learning Process

Mageswaran Sanmugam, Zaleha Abdullah , Hasnah Mohammed,
Norasykin Mohd. Zaid, Baharuddin Aris

INTRODUCTION

The term gamification was first brought up a game designer Nick Pelling back in 2004, (Rughiniş, 2013) whom tried to use game-like enhanced interface to make electronic transactions such as using the Automated Teller Machine (A.T.M); making it more attractive and engaging thus creating a game like fun to the transaction. From this came the definition of gamification; which is the "use of game design elements in non-game contexts" (Deterding et al., 2011)

Gamification is used to change behaviour, to educate, or to motivate through game elements such as points, levels, leader boards, achievements, and badges. This type of reward-based gamification has become commonplace in new social media and information-based applications. Thus with the emergence of android and apple devices; a wider population has been introduced to technology while encouraging the rise of new gamers. The current boom has created a generation of "digital natives" (Premsky, 2001; McConnigal, 2010). These are the people whose daily lives are always entangled around technologies (Johnson et al., 2011). The generation in question consists of young adults and teenagers. As these generations grew up in the age of computers and gadgets, getting them motivated in a new fad gets more and more difficult. This is true when it comes to the teenagers at the

school whose daily routine may include hours in front of devices using Facebook, commenting on the Twitter, playing with Angry Birds and listening to I-pods. Despite social networking services such as Facebook, Google+ and Twitter was shown to provide motivational affordances in relating the needs for social interaction (Boyd & Ellison, 2007); students feel held back by the boring chalk and talk lessons in the schools. This indirectly affects the students' motivation and engagement level in the classrooms. This leads to boredom and anxiety for these students leading to a detachment to the schools.

Gamification indicates the design outline pointed at giving game-like experiences to users, normally with the objective of influencing users' behaviour (Deterding et al., 2011; Huotari and Hamari, 2012) and according to Edmonds (2011), game mechanics are frequently connected to learning encounters, for instance, helping in the advancement of knowledge and learning collaborative abilities, for example, problem solving and teamwork. Paras and Bizzocchi (2005) noted that "Games foster play, which produces a state of flow, which increases motivation, and supports the learning process". A well-designed game mechanics can result in learning experiences that are intrinsically motivating. Paras and Bizzocchi (2005), also stated that Flow is the state of "being completely involved in an action for its own sake". By being in this state of Flow; the learner is completely focusing on playing the game, therefore completely submerged in the learning. However, despite the benefits, Paras and Bizzocchi (2005) also highlights that a flow experience has got to be challenging as anything not up to par is going to be irritating or ignored. Thus the challenges have to suit the skill levels of the students.

Therefore without proper implementation, it will not succeed. The discussion of this paper will focus on the elements that will assist to reach high levels at the flow zone using gamification; thus directly pushing up the motivation and engagement levels.

LITERATURE REVIEW ON GAMIFICATION

Several latest research of gamification in the context of education was chosen and reviewed to see the purpose of the research. Table 1 shows the meta-analysis of this research.

Table 1 A critical analysis of gamification

Research	Purpose	Analysis Review
Thom, J., Millen, D. R., Dimicco, J., & Street, R. (2012). Removing Gamification from an Enterprise SNS	Analyzing the effects of removing aspects of gamification from an Enterprise Social Network System (SNS)	The point's scheme influenced the contribution levels at first then later gradually it went down; thus showing the discontinuation of game like mechanics will have motivational impact on the users, especially the new users. It was suggested that a new form of game mechanics to ensure continuous motivation.
Nicholson, S. (2012). A User-Centered Theoretical Framework for Meaningful Gamification	Creating a meaningful gamification framework	A meaningful gamification succeeds if the needs of the users are prioritized over the needs of an organization. Thus resulting in long-term and deeper engagement among users. Focusing on the game mechanisms creates a false scenario in achieving goal as the positives of games lies in the fun of play and not the points itself.
Dominguez, A., Saenz-De-Navarrete, J., De-Marcos, L., Fernandez-Sanz, L., Pages, C., & Martinez-Herrai, J. J. (2013). Gamifying learning experiences: Practical	Empirical study at the tertiary level of education in the subject of "Qualification for users of ICT" where gamification was used in giving the students optional exercises that is meant to help the student's grade in	The design of educative exercises has to embrace from the very beginning. The concept of gameful design to make them more interesting for students. The quantitative analysis suggests that cognitive impact of is not very significant. Adaptation of cognitive characteristics of games cannot be infused in the traditional educative content without entering in the field of serious games.

implications and outcomes.	the final exams.	
Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013). Engaging engineering students with gamification	The purpose of this empirical study is to look into the prospects of engaging engineering students with gamification.	The findings showed engagement improved, through course attendance and the number of posts made by the students. No improvement in the student grades. There was a notion of meaningless gamification; challenges were bypassed as it was perceived to be of no use. The users felt the need of Avatars that to create networking.
Glover, I. (2013). Play As You Learn: Gamification as a Technique for Motivating Learners.	Gamification is a concept that can be used to make learning more engaging	When considering the benefits, motivation levels has to be identified; as introducing a reward system in an optimized environment has a potential to disrupt their flow and results in rewards dependency, and demotivation if the taken away. When planning a learning activity, gamification should be done and planned at the same stage. The use quality based examples; giving ratings and feedback; rather than just quantitative elements such as rewards and points.

DISCUSSION

Based on the analysis, it can be suggested that the elements of gamification have the potential to increase student's motivation and engagement. However, it is crucial to identify their levels of motivation as introducing a reward system in an optimized environment has a potential to disrupt flow; resulting in dependency on the rewards, and demotivation if the reward system is taken away. These motivation levels are distinguished into four categories (Marczewski , 2013):

- 1) Relatedness-the users want to have social connection and feel belonged in a group.
- 2) Autonomy- the users want to be in control, and prefer freedom

in choosing their path.

- 3) Mastery- the users prefer personal development.
- 4) Purpose- the users want to know the reason why they are doing these tasks, altruism.

Finally the reward too needs to be achievable and desirable to push up the motivation level, yet it has to be limited to create a sense of achievement in receiving it. Meaning in creating a sense of achievement the students require more than receiving points. A different type of rewards needs to be granted to the students as they may feel bored or unappreciated from achieving the same complimentary badges as others. Therefore there should be a special exclusive reward allocated for the best of the best. Besides that, to make them feel more appreciated, peer compliment can be encouraged. Meanwhile as found by Thom, et al. (2012), points element in a gamified system can have negative impact if its take away from an already existing system. This was highlighted by Zichermann (2011) whom states that one cannot stop the external motivators if the users are used to it. This was more evident in new users into a certain system as they may only be getting immersed in the system, with the points being early boost. Before they get to know the system, they are evidently demotivated by losing the extrinsic motivational factor, which are the point's elements.

Despite this, all the other research, showed that implementation of gamification has positive impact on the users' motivation (Spence et al., 2012; Dominguez et al.2013) whether it's through online or traditional method of gamification. On the aspects of engagement, we can see from the research by Barata, et al. (2013) showed the student's participation can increase thus certifying the improvement in engagement, yet what comes to mind is that there is no improvement in grades despite the use of gamification. This is also evident in another research by Dominguez et al.(2013). Yet this contradicts with findings stated by Zichermann (2011), who states that "in education, game mechanics are proving to be very useful tools within the classroom". Zichermann (2011) also found that by incorporating

games into the curriculum by using leader boards and social challenges showed a noticeable improvement in reading and math. Therefore, it cannot be concluded yet that grades cannot be influenced by the gamified system. Before gamification elements are infused in teaching and learning, one has to see how to create a meaningful gamification. Nicholson (2012) stated in the research that a meaningful gamification will only succeed if it puts the needs of the users first over the needs of an organization. When this occurs, users will have a positive experience which results in a long-term and deeper engagement among participants. This is important as the biggest problems that will arise when the implementation looks into teaching and learning process is that gamification has to bypass the needs of the organization and look at the needs of the users. The organization in the context of Malaysian education is the Ministry of Education, and the schools, while the users are the students. Though it may have been a problem with the old education system; yet with the current school based assessment that allows the teachers to implement and carry out teaching and learning process unimpeded, meaningful gamification can be implemented. Focusing only on the game mechanisms will create a false scenario in achieving a goal. The positives of game experience lies in the fun of play and not the points itself. Yet, according to Glover (2013), when considering whether gamification can benefit a group of students, it is crucial to identify their levels of motivation and introducing a reward system in an optimized environment. This is because the rewards elements have a potential to disrupt their flow and resulting in dependency on the rewards, and demotivation if the reward system is taken away as seen in the research by Thom, et al. (2012). Gamification should use more of quality based examples; such as students giving ratings and feedback among themselves; rather than just quantitative elements such as rewards and points. Utilizing external rewards such as points without matching them to the underlying exercises makes an empty gamification experience and instils a negative feeling in the users. This will disrupt the flow of the users as the challenge does not tally with the skills. We can

see a few problems that can interrupt a meaningful teaching and learning process using gamification; for example the creation of unhealthy competition among students whom strive to collect points, badges and are willing to do anything to finish on top of the leader board. This leads to an unwanted scenario that may create attrition among weaker students. Thus to avoid this, one has to make sure elements suits the students and the environment. For example as suggested by Deterding (2011), the placement of game elements, such as leader board should not show the rankings according to numbers but instead show the users the person ranked one slot above and below; which allows the user to challenge the person ranked higher and avoid being overtaken by the person below the user.

CONCLUSION AND IMPLICATIONS

Based on the findings above we can see the elements that drive gamification, which is points, badges and leader boards tend to influence motivation and engagement among its users. This can be important when it comes to gamifying teaching and learning, as these elements makes sure that the students are able to follow the lesson carried out by the teacher. Yet despite lacking evidence that gamification helps when it comes to cognitive improvement, but one has to take into account the amount of participants, the duration of time, the capability of the students and whether it was a meaningful gamification before coming to a conclusion about the effectiveness of the elements in gamification. Therefore a careful planning, which gives emphasis on motivation and engagement are needed before using the game elements in the system and because the implementation can happen in both traditional and technology based classroom, gamification can pave a path to the future of a meaningful teaching and learning process in Malaysia.

REFERENCES

Boyd, D. M., & Ellison, N. B. (2007). Social Network Sites:

- Definition, History, and Scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210–230.
- Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013). Engaging Engineering Students with Gamification An empirical study. *2013 5th International Conference on Games and Virtual Worlds for Serious Applications*, 1–8.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness : Defining “ Gamification .” In *MindTrek '11 Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, 9–15.
- Deterding, S. (2011). Meaningful play: Getting gamification right. *Google Tech Talk*.
- Dominguez, A., Saenz-De-Navarrete, J., De-Marcos, L., Fernandez-Sanz, L., Pages, C., & Martinez-Herraiz, J.J. (2013). *Gamifying learning experiences: Practical implications and outcomes. Computers and Education*, 380-392.
- Edmonds, S. (2011). Gamification of learning. *TRAINING & DEVELOPMENT IN AUSTRALIA*, 20–23.
- Glover, I. (2013). Play As You Learn : Gamification as a Technique for Motivating Learners. *Ed Media 2013*, 1999–2008.
- Huotari, K., & Hamari, J. (2012). Defining Gamification - A Service Marketing Perspective. In *Proceeding of the 16th International Academic MindTrek Conference* (pp. 17–22).
- Johnson, L., Smith, R., Willis, H., Levine, A., & Haywood, K. (2011). *The 2011 Horizon Report*. Austin, Texas: New Media Consortium.
- Marczewski, A. (2013). *Gamification: a simple introduction*. Andrzej Marczewski.
- McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. Penguin
- Nicholson, Scott. "A user-centered theoretical framework for meaningful gamification." *Games+ Learning+ Society* 8 (2012): 1.
- Paras, B., & Bizzocchi, J. (2005). Game, Motivation, and Effective Learning: An Integrated Model for Educational Game Design. In *DiGRA 2005: Changing Views: Worlds in Play, 2005 International Conference*.
- Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On*

- the Horizon*, 9(5), 1–6.
- Rughiniş, R. (2013). Gamification for Productive Interaction Reading and Working with the Gamification Debate in Education. In *The 8th Iberian Conference on Information Systems and Technologies CISTI 2013* (pp. 1–5).
- Spence, M., Foster, J. A., Irish, R., Sheridan, P. K., & Frost, G. S. (2012). “Gamifying” a library orientation tutorial for improved motivation and learning. In *2012 ASEE - American Society for Engineering Education Annual Conference*.
- Thom, J., Millen, D. R., Dimicco, J., & Street, R. (2012). Removing Gamification from an Enterprise SNS. In *Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work* (pp. 1067–1070).
- Zichermann, G. (2011). *Gamification Is Here to Stay* - Gabe Zichermann - The Atlantic.