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AN ANALYSIS OF GAMIFICATION ELEMENTS IN ONLINE LEARNING TO ENHANCE LEARNING ENGAGEMENT

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ABSTRACT. Evolutions in technology have changed the day-to-day especially in education. The ways of teaching and learning have begun the same process. Only the methods can be varieties depends on the instructors. Nowadays, the interest-growing topic in education is about gamification. Various approach has been introduced through gamification to engage student learning but there is still criticism of gamification. Thus, this paper will present an analysis of the existing gamification elements applied in teaching and learning to enhance learning engagement. A survey of the literature was conducted to analyze the existing gamification elements applied in teaching and learning. A deep search of academic literature was undertaken includes books, journals, conference paper, articles, dissertations and theses. Suggestions on how to integrate gamification environment are also included in order to propose new model of engaging online student using gamification elements.

Keywords: gamification, education, engagement, e-learning

INTRODUCTION

Gamification has been regarded as one of the important ideas on the educational prospect. Despite the fact that gamification has long been practiced in the field of marketing such rewards and point cards. Since few years, gamification has a significant impact in a wide range of educational institutions (Khaleel, 2016; Seaborn, 2015). Gamification also widely applied in health and wellness, online communities and social networks, engineering and marketing (Seaborn et al, 2015).

Various approaches have been introduced through gamification to engage student learning but there is still criticism of gamification, which has been declared (Dominguez et al., 2013; Knutas et al., 2014; Khaleel et al., 2016). Few researchers stated that gamification has the potential for a positive impact on performance, productivity, and user engagement (Simoes et al, 2013). However, through gamified also may fail to sustain user engagement and to drive participation (Burke, 2014).Obviously game elements are effective mechanisms for increasing user engagement, but different game elements have different impacts on user engagement (Amriani et al , 2013; Gedera, 2014; Schreurs et al., 2012). Different courses also may need different approach or strategies to enhance user engagement. In fact, several studies in theoretically explained how and why the need to implement the game elements to enhance learn-

ing engagement but there is still little empirical evidence on the actual impact (Dicheva et al., 2015). Suh et al. (2015) highlighted that the impacts of game dynamics on user engagement can vary depending on the different purposes of systems to be gamified.

Past research also showed that less engagement among students in building knowledge because often times the students are treated as ordinary technology users (Tan, 2013). Taylor and Parsons (2011) found that majority of education institutions measure the level of students' achievement not the levels of student engagement in learning. However, the measurement of students' engagement is hard to define. Hence, the effective learning and teaching practices, should promotes active learning in online learning and encourages pedagogical in the learning process (Maloshonok, 2014). Table 1 shows the challenges and problems when applied gamification in e-learning.

Table 1: Summary of issues and challenges with regard to apply gamification in learning

Author (s)	Issues/ Problems/ Challenges
Khaleel (2016)	1. Lack of game elements that provide the full explanation of each learning contents 2. Representation of learning content that effects the speed of receiving the information (understanding) 3. Difficulties in adapting to a new learning experiences
Gene et. Al (2014)	Issues throughonline courses 1. Lack of enough time to go through the course 2. Different level of the course 3. Lack of motivation 4. Attracted in a specific part of the lesson 5. Frustration with the course
González et al (2014)	1. Student felt bored and found inappropriate use of the system 2. Lack of Interest andmotivation to continue learning
Graziela (2014)	Stress out that students still 1. Lack of concentration 2. Desire in teaching and learning process.
Dominguez et al (2013)	Students are not enjoying with the competition elements such as leaderboard and have problem with task evaluation: 1. Student can cheat while uploading the empty screenshots of their work and get the reward. 2. Students felt burden to submit and upload files 3. Technical problem during uploading screenshot images
Brühlmann (2015)	Future studies could vary the amount of feedback given by the system to examine effects of different degrees of feedback in varying conditions.
Tan (2013)	Problem of maintaining student motivation and engagement for courses that are entirely online
Tracy (2014)	Highlight that the most challenging task to motivate player to play is to set a rules which is the game should have the elements of challenge, competition and interaction to make player enjoy playing the game

THE USE OF GAMIFICATION IN EDUCATION

Gamification is a use of game design elements in a non-game context to enhance user engagement. According to Gok et al (2016), gamification is a powerful tool to take and keep people's attention and to engage people with their peers and activities to reach desired outcomes. Gamification also refers to the use of game elements (game thinking) in a non-game context to increase engagement between humans and computers, as well as solve problems with high quality, as exemplified by modern electronic applications (Khaleel, 2016).

Gamification is an upcoming method in learning, with ongoing research in its use as engagement method (Barata,2013; Glover, 2013) or engaging by competition (Dubois & Tamburelli, 2013). It has also been used as an engagement method in the increasingly popular Massive Online Open Courses (MOOCs) (Romero &Usart, 2013, Tan,2013). However, using gamification sometimes negatively affect the course (Berkling& Thomas, 2013).

Gamification in E-Learning

There is a lack of studies analyzing the practices and the effect of gamification throughMassive Open Online Courses. Few experiences integratingserious games as integrated activities of MOOCs (Freire et al., 2014; Romero &Usart,2013). Most researchers agreed that gamification can increase student engagement and motivation (Dominguez et al, 2013; Paisley, 2013). Charles et al (2011) also mentioned that gamification can strengthen the social relations and raise satisfaction.Game Based Learning is an actual game to teach knowledge and skills while gamification use a few game elements such as reward, status, level, point, badge and others.

In order to cater different types of learning, designers need to use game elements in an educational context. Game require individuals to use prior knowledge, transfer new information into new situations, apply an information in correct contexts and learn from immediate feedback (McGrath, 2013). According to Khaleel et. al. (2016), enjoyable learning environmentshould be adapting in order to solve a given problem. Silpasuwanchai (2016) mentioned that gamification is a multi-disciplinary research area with increasing popularity in the recent three years, attracting the interest of the Education includingGame Design Communitiesand HumanComputer Interaction (HCI). Gamification was useful in online learning environments, follow by classrooms, desktop apps and mobile apps, with computer science being the most commonly gamified subject.Studies have shown that applying gamification elements via online engages users.

In the same fashion, use ideas from game design to enhance education. The goal is to increase students' engagement. Gamification allow educator to set up appropriate learning environment and implements game element that can courage student engagement. Huang and Dilip (2013) mentioned the 5-step process to apply gamification in education as shown in Figure 1.

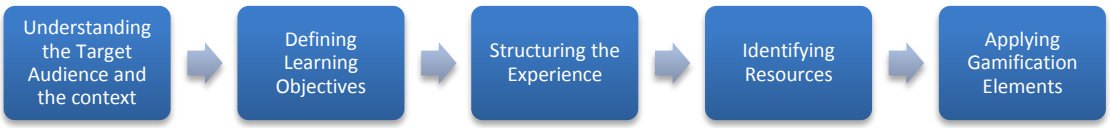

Figure 1. Process to apply gamification in education

Gamification Elements

Stanculescu et al, (2016) highlighted that game mechanic is a tools employed by the gamification engine to guide the player toward the desired goals. Thereis popular game mechanic that's always applied in teaching and learning such as (i) ***Leaderboard:*** Shows the rank, names and scores. The leader board is personalized as it highlights the player's position for easy identification. It is used to increase the peer-group pressure in order to let students compete with each other; (ii) ***Badge:*** Badges are awarded to a user after perform the task given; (iii) ***Point:*** It is a scoring system. The point will be given when a task is completed. Points also can be earned by actively involving in the. A point system can be designed for experience points, redeemable points, skill points, karma points and reputation points; (iv) ***Awards, Trading and Gifting (Prize, Reward):*** At the end of the session, the points could turn for physical prizes, which were small inexpensive trinkets that students can enjoy, such as matchbox cars and stickers; (v)***Level:*** Points and levels are connected to maximize sense of achievement and (vi)***Avatar:*** Known as virtual representation of self. Student can select character to interact with the system.

Table 3: Game Elements applied by researchers for teaching and learning

Game Elements	Werbach& Hunter (2015)	Morrison et al (2014)	Measles & Abu-Dawood, (2015)	Khaleel et al (2016)	Stanculescu et. al (2016)	Bianchini et al (2016)
Leader Board				X	X	X
Badge / Medals	X	X		X	X	X
Point	X				X	X
Level	X			X	X	X
Awards, Trading & Gifting/ Rewards			X			
Progress Bar/ Status		X		X		
Challenge						
Actions					X	
Rules					X	
Feedback/ Reports				X	X	
Quest/ Goal/ Mission	X	X	X	X		X
Avatars	X					

METHODS

A survey of the literature was conducted to explore the existing gamification approach applied in teaching and learning to enhance learning engagement. There are five steps applied in this study. Step 1 - General Database Search: A survey of the literature was conducted to explore the existing gamification approach applied in teaching and learning to enhance student engagement. A deep search of the academic literature was undertaken using ACM Digital Library (ACM), ScienceDirect (SD), IEEE Xplore Digital Library (IEEE), Springer, Scopus, Emerald, Google Scholar and Research Gate. The sources types are include books, journals, reports, conference paper, articles, dissertations and theses, E-book and working paper within the year from 2013 to 2016. The terms gamification, engagement, learning and education were used to search all publications. This study are discuss about existing gamification elements applied in teaching and learning. Step 2 - Focus Search: After collecting a few papers, these review focus on exploring existing gamification approach and factor effecting engagement using online learning. Step 3- Additional Search: In order to gain more details information, searching is doing through references and gets direct information from researchers through ResearchGate platform. Step 4 – Analysis: After complete reviewing the papers, all

data are analyzing using table matri and Step 5- Future Study**:** For further study, researcher will propose new gamification approach that can engage student learning.

ANALYSIS OF THE LITERATURE SURVEY AND ITS DISCUSSION

Engage can be defined when user wanted to learn or to occupy the intentions or efforts of a person's (Kenne, 2014). Engagement is simply the students' depth of interaction, physically and cognitively, with the content (Butt, 2014). In order word, engagement focuses on keeping learners' attention for long time. Without engagement, learners will not be motivating to do the task. Also can be referred to the average session length (total time of a user spent/ number of sessions (Stanculescu et al, 2016).

The engagement theory that consists of three main areas (i) Relate, (ii) Create and (iii) Donate emphasizes the effective learning andteaching practices should promote active learning in online learning and encourages effective pedagogical practices in the learning process (Maloshonok, 2014). In addition, when applying gamification concept in elearning ,it can improve student engagement (Amraini, 2013). Students' engagement in learning and teaching process is important as it has an impact on achieving learningobjectives and overall satisfaction. Moreover, active engagementleads to learning effectiveness and satisfaction.

From the investigation conducted towards past studies, active engagement in learning process such as asking questions,play role,listeningandvolunteering opinion help students to understand better even on complex topic, able tothink critically and argue effectively, affect their learning achievement with scores better marks and has better influence on their learning satisfaction (Schreurs and Alhuneidi,2012). Rabbany et al., (2013) added that current online learning tools donot have an established structure to evaluate students' engagement in online discussion. In order to encourage students to activelyparticipate in online discussion, evaluation process has become one of the key elements.

Moreover, the delivering task to students presents high impact on students' engagement (Gedera, 2014). Learning managementsystem has been proven to encourage a constructive approach to knowledge acquisition and support active engagement (Emelyanova and Voronina, 2014). Some strategies to increase student engagement in online coursesare meaningful participation; community and collaboration; peertopeerwriting; and creativity (Angelaki&Mavroidis, 2013). Hence, Prata, (2015) suggested instructors to break students into smaller groups fordiscussion in order to promote active engagement in their teaching practices. Therefore, instructor role as facilitator is important inmonitoring students' participation and engagement in the constructed learning activities.

Table 4 shows popular game mechanic that can be applied in teaching and learning. An analytic hierarchy process has been done by Daud et al (2016) and Yusoff et al (2016). Daud (2016) identified the top six gamification that can ensure learning engagement are team leaderboard, redeemable points, check points, rewards, trophies –badges and memory games. Yusoff et al. (2016) highlighted the best gamification mechanic for TVET learning are Peer Grading, Skills Points, Wally Games, Virtual Goods, Rewards, Trophies and Badges.Nevertheless, other game mechanic also has an effect on the learning process. Educators should know how to use the appropriate game mechanic in teaching and learning.

Table 4: Game Mechanic

Mechanic	Synonyms/ Alternative	Subtypes	Short Descriptions	Authors
Points	Measure, Metric, Currency	Advancing, Redeemable, Exp Point,	Numerical unit indicating progress-based on progression	Bianchini et al (2016); Stanculescu et. al (2016); Werbach& Hunter (2015)

		Reputation, Score	through lab task	
Rewards	Incentives, prizes, gifts	-	Tangible, desirable items, extra credit	Measles & Abu-Dawood, (2015); Stanculescu et. al (2016)
Badges	Trophies, Medals	-	Visual icons signify-ing achievements	Khaleel et al (2016); Morrison et al (2014); Stanculescu et. al (2016);
Leaderboard	High score, scoreboard	Points, avatars	Display of ranks for comparison	Bianchini et al (2016); Cheong et al. (2013); Dominguez et al (2013); Morschheuser et al (2014); Khaleel et al (2016)
Progression	Level up, Levelling	Track	Milestones indicating progress	Morrison et al (2014)
Status	Title, Ranks	-	Textual monikers indicating progress	Khaleel et al (2016)
Levels	Stage, Area, World	-	Move from one level to other level	Bianchini et al (2016); J.lai et al. (2012); Khaleel et al (2016)
Roles	Class, charac-ter, Status	-	Role-Playing elements of character	Marfisi-Schottman et al (2014)
Mission	Goal, Chal-lenge	Individual, collective	Complete the task given	Bianchini et al (2016); Dormans (2012); Kapp (2012); Morrison et al (2014)
Achievement	Trophy, virtual good, virtual coins, medal, cups	Certificate Expected, unexpected	Student who complet-ed more than 90% of the task	Goehle (2013)
Skills	Level	Beginner, Ex-pert user	Give users the oppor-tunity to learn and expand.	Ozelik et al (2013), Paisley (2013)
Feedback/ Notification	Answering Question, Message, Alert, chat	*Informational*: points, notification, achievements, narration; *corrective*:	Acknowledgment of successfully executed actions	Measles & Abu-Dawood, (2015); Kapp (2012); Khaleel et al (2016); Stanculescu et. al (2016);;Kapp (2012)
Event	User actions, mystery game, treas-ure hunt	Operative, resultant, external, interim	Systems that process events.	Marfisi-Schottman et al (2014)
Good	-	Virtual, real	Allow player to ex-pend their virtual currency on real or virtual goods	Bunchball Inc. (2010)
Narrative Context	Storytelling	-	Tell story and let people tell theirs	Kapp (2012)
Avatar	Icon	-	Virtual representations of self	Wakefield et. al(2012); Werbach& Hunter (2015)
Collaboration	Communicate	-	Social Interaction between player	Dominguez et al (2013);

CONCLUSION AND FUTURE WORKS

There are few things to consider when designing gamification activities for instructor: (i) Introduce the gamification elements to students before start the class and provide gamification tool for teaching and learning; (ii) Create variety of game design in order to enhance student engagement and (iii) Aim to incorporate as many gamification activities as possible either in individual task or team. To conclude, gamification is an approach that needs interactive activity to engage student learning. In fact, designing and applying gamification in teaching and learning will help learners to learn betterand increase learning engagement. Applying gamification approach in online may require a bit of effort, but the students will feel more engage,

and having fun.However, instructor and instructional designer are play the most important roles in the classroom, nobody can replace them.

For future work, the existing model of engaging online students and instructional design elements (Hew, 2015), does not involve gamification concept. Thus, this study will propose new gamification approach that can be used effectively in learning process and can enhance students' engagement. The suitable gamification elements should be applied to overcome the issues because it's can help students to learn and transform the subject in something curious and interesting.Educators should not be focused on the theories but also add new approach to attract students and actively engage in learning.Indeed, this study will suggest a new model of engaging online student using gamification elements which is proper preparation is key to successful gamification.

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