The effect of gamification on motivation and engagement

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Abstract

Purpose – Gamification is the application of game features, mainly video game elements, into non-game context for the purpose of promoting motivation and engagement in learning. The application of gamification in a pedagogical context provides some remedy for many students who find themselves alienated by traditional methods of instruction. The use of gamification could provide a partial solution to the decline in learners’ motivation and engagement the schooling system is facing today. Specifically, the college environment could benefit a lot from gamifying not only their graduate recruitment strategies, but also the college course content and curricula. This critical analysis of literature on gamification is intended to be part of a sequence on the effect of gamification on motivation and engagement. A proposed methodology in the study of gamification effect on motivation and engagement in addition to an empirical study on three college courses are being finalized to complete this trilogy. The paper aims to discuss these issues.

Design/methodology/approach – Themes covered in the literature review include: conceptualizing gamification, advantages of gamification over game-based learning, theoretical connections to gamification, motivation and engagement, connecting gamification to motivation and engagement, emotions and fun in gamification, player types and gamification features, gamification in action, and implementation guidelines.

Findings – The literature on the effect of gamification on motivation and gamification is still limited on multiple levels. There is a gap between theory and practice in the study of gamification. There is limited literature on the implementation guidelines of the gamified designs.

Practical implications – This critical analysis of literature is followed by connecting it to future research by the same author as part of a sequence on the effect of gamification on motivation and engagement. The second project, will be proposing a methodology for any successful design to provide a holistic understanding of the topic of gamification. Finally, an empirical study on the effect of gamification on students’ motivation and engagement in three college courses will be submitted to complete the trilogy.

Originality/value – This paper is a literature review, so there is a strong connection to literature on this topic. However, the synthesis of the themes and ideas are original. The literature review is extensive and covers the different aspects of the topic of gamification and its relationship to motivation and engagement.

Keywords Gamification, Game-based learning

Paper type Literature review

The game culture spreads among a large proportion of the world population where parents are getting involved in the video game play and the average age of video game players is no longer in the teens. Parallel to that is the increased attention surrounding the use of video game elements in non-game contexts or gamification (Ludgate et al., 2015). Gamification is a newly coined term that reflects a social phenomenon arising with a generation of digitally literate population. Gamification has been defined as the use of “game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems” (Kapp, 2012, p. 125). This operational definition, which will be used in this literature review, incorporates important pedagogical components. First, the pedagogical application of gamification to promote learning is emphasized as contrasted to business applications. Second, digital game mechanics, which include, but are not limited to, avatars, badges, points, levels, leaderboard, virtual rewards, and storyline or quests, are highlighted. Third, there is a reference to game dynamics, which are focused on game elements that allow for social interaction between players. In addition, motivation and engagement are included in this definition as possible effects of gamification. The fourth pedagogical component in Kapp’s (2012) definition is
the emphasis on critical thinking skills, which are essential in learning and could be partially promoted through gamification.

Although non-digital game components have wide applications in educational contexts, the focus of this paper is on the digital video game elements that are used in pedagogical context to promote task engagement, increase motivation, and enforce desirable learning behaviors. The rationale behind deploying video game elements in an educational context is that they have already captured the attention of millions of loyal players all over the world. In the USA, about 58 percent of the population played video games (Folmar, 2015). Unlike the general assumption, the average age of video game players is thirty with almost a balanced percentage of males and females: “There are more females over the age of thirty playing video games than boys under eighteen, and one-third of parents play video games with their kids regularly” (p. 2).

A significant problem that many schools and educators are facing today, as Zichermann and Cunningham (2011) posited, is that many students are lacking the motivation and interest to learn. If given a choice, many of them would prefer to play video games rather than reading a book or completing a homework assignment. The solution is not, as many educators, policy makers, and politicians suggest, resolved by creating additional educational standards or adding more standardized tests in an endless cycle of trial and error. Prensky (2001) enthusiastically presented the solution to learners’ disengagement through the marriage of education and entertainment; thus, the term edutainment. Some proponents of gamification, such as Zichermann (2010), are for more –tainment than –edu. Prensky (2001) confirmed that there is no magical recipe, but that depends on the context and is left to teachers to design the perfect mix of education and entertainment depending on their students’ needs.

According to Prensky (2001), game features can provide the –tainment part of the educational design needed to engage learners. Borrowing game elements, he argued, and incorporating them into the classroom environment can facilitate engagement. Little research has been done on the effect of gamification on motivation and engagement of the learners. The research literature connected to gamification is limited on multiple levels and there is a need to explore the long-term effect of gamification in promoting and sustaining learners’ motivation and engagement. This literature review will include studies done on the effect of gamification on learners’ engagement and motivation.

In this literature review, research connecting gamification to motivation and engagement will be explored under these themes: conceptualizing gamification, advantages of gamification over game-based learning (GBL), theoretical connections to gamification, motivation, and engagement, connecting gamification to motivation and engagement, emotions and fun in gamification, player types and gamification features, gamification in action, and implementation guidelines.

**Conceptualizing gamification**

There is no consensus on the definition of gamification among researchers, nor is there an agreement on the difference between GBL and gamification. Kapp (2012) discussed the definition of gamification in a pedagogical context contrasting it to GBL. Based on Kapp’s view, the instructional strategy is changed to accommodate game elements where, instead of the learning objectives, the teacher in a gamified classroom will present a challenge or quest that the players will need to undertake leading them to the learning experience.

Some researchers defined gamification as the use of game elements, mechanics, features, design, and structure in a non-game environment or context (Attali and Arieli-Attali, 2015; Bruder, 2015; Dale, 2014; Davis, 2014; Deterding, 2012; González et al., 2016; Hanus and Fox, 2015; Issacs, 2015; Kapp, 2012; Powers et al., 2013; Keeler, 2015; Koivisto and Hamari, 2014; Seaborn and Fels, 2015; Sheldon, 2011; Whitton and Moseley, 2010; Zichermann, 2011). This non-game environment is broad enough to cover the wide application of gamification.
in business, thus Zichermann and Cunningham’s (2011) definition: “The process of game-thinking and game mechanics to engage users and solve problems” (p. xiv). Gamification, according to Simões et al. (2013), is the utilization of game mechanics and game dynamics in “non-game applications” (p. 348). The definition of Simões et al. (2013) was focused on the social aspect of gamification, such as collaboration. Leaning’s (2015) definition of gamification as an experience outside of gaming context is as broad as the previous definitions.

There are some definitions where the pedagogical applications of gamification are emphasized. Kingsley and Grabner-Hagen (2015) posited that gamification should be understood as a combination of “content area instruction, literacy, and 21st century learning skills in a highly-engaging learning environment” (p. 51). In the eyes of Hamari et al. (2014), gamification becomes more complex with specific focus on “motivational affordances” and change in behavior as an outcome (p. 3026).

Folmar’s (2015) definition captured an important idea in the application of gamification in learning and other fields: game thinking. He defined gamification as “the use of game thinking and game mechanics to meet non-game ends” (p. 2). The lack of game thinking when using gamification in an educational context is what many gamification proponents, such as Zichermann (2010), considered the chief reason for its occasional failure in different contexts. Game thinking mandates rethinking teaching practices, not just adding game elements without considering how gamification works: “Gamification is not just making a game, which imparts a lesson; it is applying game thinking to how we impart that lesson and continuing to develop it based on the feedback from the players” (Folmar, 2015, p. 5).

In traditional instructional methods, the students earn their grades based on a performance of a task as they demonstrate achievement, whereas in gamification the effort is rewarded, with badges or points even when the objective is not completed: “that is what gamification does, it rewards the effort [emphasis added], not the winning” (p. 7). In other words, in a gamified environment the students are encouraged to engage in the process and reasoning and are evaluated accordingly regardless of whether they succeeded in their endeavor or not. Of course, this is not to undermine the importance of task but rather to motivate the learners to exert effort in tackling different learning challenges. Brewer et al.’s (2013) study on children (five to seven) has shown that the use of gamification increased the percentage of task completion from 73 to 97 percent.

To illuminate the different elements that comprise the meaning of gamification, it is important to discuss the difference between gamification and GBL.

**Advantages of gamification over GBL**

Proponents of gamification propose that it has a lot of advantages over educational games. Before discussing the logic behind this argument, it is important to understand some game terminology. GBL is intended solely for education and relies on a learning game that has a beginning and an end. Serious gaming is a broader term used to describe games intended for education, industry, training and stimulation (Connolly et al., 2012).

Table I shows the low frequency in the search results of the term gamification as compared to GBL, serious games, and educational games. The search in the databases, Eric, Sage, ScienceDirect, and GoogleScholar, was conducted using keywords: gamification,

<table>
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<th>Educational games</th>
<th>Serious games</th>
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Table I. Database search results

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game-based learning, educational games, and serious games. Other than gamification, all the search included the word “game” to narrow down the results. GoogleScholar had the largest number of results on gamification because it included conference proceedings, websites, and online documents. All in all, the results reflected the recency of the topic of gamification as compared to other game-based topics. Gamification and GBL are an area of confusion and misunderstanding for many educators and game designers. The two concepts: gamification, and GBL, are distinctively blurred for Nah et al. (2013). They stated: “By turning an activity or a process into a computer game, i.e. through various game design elements such as rewards for achievement, desirable behavioral change can be induced” (p. 99). Gamification is not when learning is changed into a computer game but rather when adding a design layer of game elements to enhance learning, increase engagement, and encourage positive behavior. Keeler (2014) posited major differences between gamification and GBL. GBL is realized as learners play games to learn content. In contrast, gamification involves the deployment of game elements in an environment outside of digital games. Issacs (2015) also made a clear distinction between the two approaches as gamification helps in creating an atmosphere associated with gameplay and conductive to learning while GBL, he added, relies on a game as a vessel for learning content. Simões et al. (2013) elaborated upon how gamification works differently from GBL in the classroom. Gamification, they explained, utilizes the most effective components of video game elements without committing to a specific game resulting in increased levels of motivation and engagement in the learning experience. Gamification in education is an ongoing process that harvests the most engaging game components and applies them to increase motivation and engagement among learners. It creates a long-term effect, as Folmar (2015) argued, on engagement and motivation as compared to GBL where engagement is short-lived, usually during the duration of the game. Once the game is completed, many learners or players do not have any more interest in a game they have mastered and completed. On one hand, gamification works by adding elements inspired from games to the classroom environment mainly to increase motivation, engagement, and promote desired learning behaviors. Whereas GBL, on the other hand, relies on using games to meet learning outcomes. The learning is facilitated through playing games whether digital or non-digital. Zichermann (2010) in his support of gamification over GBL, emphasized the idea that educational games industry had produced few successful games. The last one, he claimed to be so, was “Where in the World is Carmen Sandiego” which came out in 1985. Since then, very few games have achieved similar success. McGonigal (2011) supported Zichermann’s (2010) argument in advocating gamification and further elaborated on why educational games are short-lived and do not meet the needs of the schools and educational systems. She argued that educational games are not sufficient to meet the growing needs of students and are at best temporary solution. McGonigal (2011) joined Prensky (2001) in recommending the gamified path in teaching and learning that allows students to engage in from beginning to end. It is important to explore the theoretical foundations for the study of gamification before discussing in detail the connection between gamification, motivation, and task engagement. 

**Theoretical connections to gamification**

The knowledge base connecting gamification to theoretical principles is thin and the empirical research on gamification founded on theoretical principles is scarce. For example, Seaborn and Fels (2015) did a review of peer-reviewed literature on gamification and engagement of 32 studies. Only ten of them were founded on theories (five of which by the same author) and the rest had no connection to theoretical foundations. Furthermore, there is “a gap between theory and practice – where theory is empirically unexamined [in the
context of gamification] and applied work lacks reference to theory – which serves to limit the growth of the field” (Seaborn and Fels, 2015, p. 27). This highlights the need of research on gamification with strong theoretical links that bridge the gap between theory and practice. In understanding the connection between gamification, motivation, and engagement, the three theories of self-determination, new literacies study (NLS), and behaviorism are proposed.

**Self-determination theory (SDT)**

Motivation and engagement, as a major focus of this literature review, are at the heart of SDT of human motivation. SDT rests on the three principles of autonomy, competence, and relatedness (Deci and Ryan, 2008; Seaborn and Fels, 2015). According to Baard et al. (2004), competence is connected to the motivation to overcome challenges and achieve success. The need for autonomy, they added, relates to volition and choice-making in pursuing and being responsible for one’s actions. The need for relatedness, they elaborated, is about social status and a connection with others based on mutual respect and interdependence. The three elements of SDT constitute human psychological needs to make choices, to compete and collaborate with others; all of which can be afforded in the gamified environment.

Many players in a gamified environment, according to Gee (2003), choose their own avatars, choose to play the game competitively, or by working with others in affinity groups (autonomy and volition). Many feel satisfied as the results are displayed on leaderboards of the gamified environment they engage in, highlighting the social element of relatedness. Studies have shown that the elements of SDT positively affect intrinsic motivation: “considerable research has found interpersonal contexts that facilitate satisfaction of the basic psychological needs for competence, autonomy, and relatedness to enhance autonomous motivation, which comprises intrinsic motivation and well-internalized extrinsic motivation” (Deci and Ryan, 2008, p. 14).

Researchers have established a connection between video game elements and motivation, on one hand, and SDT, on the other hand. When players engage the gamified environment, they willingly immerse themselves in virtual challenges for the purpose of achieving fun and play; elements deeply rooted in human beings: “Intrinsically motivated activities are those that the individual finds interesting and performs without any kind of conditioning, just by the mere pleasure of carrying them out (Francisco-Aparicio et al., 2013, p. 114).

**NLS (theory)**

NLS is an extension of the new literacy theory with a special focus on the digital environment as a semiotic domain for taking and processing meaning. In the NLS theory, meaning is considered outside of language and beyond the digital tools as it “involve[s], as well, ways of acting, interacting, valuing, believing, and knowing as well as often using other sorts of tools and technologies” (Gee, 1997, p. 10). The NLS is an umbrella term for all kinds of digital literacies which include taking in and processing meaning (Gee, 1997).

Gamification is a form of digital literacy where many layers of meaning making and processing take place. One of these modes of learning is through the affinity groups and the many forms of social interaction in the digital game environment (Gee, 2003). Consequently, behaviorism, with the individual learner at its center (Gee, 2000), conflicts with NLS that seeks to find meaning outside of the individual through and in the social environment. This seemingly conflicting premise of the two theories of behaviorism and new literacy studies can be reconciled by drawing from elements of both theories as they pertain to the learning atmosphere afforded by gamification. Challco et al. (2015) argued that gamification allows for learning to happen individually as the learners feel extrinsically and intrinsically motivated through gaining points and winning awards. At the same time, the social aspect of gamification through collaboration and competition, they added, is very important. Thus, the use of both behaviorism and NLS is justified.
Behaviorism: relating conditioning to gamification

Gamification also has a strong connection to theories in human psychology, specifically behaviorism. According to González et al. (2016), gamification can produce significant behavioral change “from an early age using the dynamics of games” (p. 549). Some researchers explained this connection between gamification, on one hand, and human psychology and behavioral science, on the other hand, as gamification “rests on three primary factors: motivation, ability level, and triggers” (Dale, 2014, p. 85). Some of the basic principles of behaviorism, such as enforcing a certain behavior by rewards and correcting a misbehavior by lack of rewards or a form of a penalty, are parallel to gamification elements such as rewarding and penalizing through points and badges, or upgrading and demoting in a game setting.

Skinner (1984), one of the fathers of behaviorism after Watson in the 1920s, realized the connection between behaviorism principles and some of the elements in the simple video games: “No one really cares whether Pac-Man gobbles up all those little spots on the screen [...] What is reinforcing is successful play, and in a well-designed instructional program students gobble up their assignments” (p. 952). Skinner (1937) coined the term “operant conditioning” when discussing the premises of behaviorist principles which is the “study of reversible behavior maintained by reinforcement schedules” (Staddon and Cerutti, 2003, p. 115). There are two types of reinforcement schedules: fixed and variable. Chou (2015) posits that both fixed and variable reinforcement schedules are used in the gamification design. However, the fixed reward, which he named “earned lunch,” is less engaging than the variable reward schedule, which he calls “mystery box” (p. 1). Whereas, fixed reinforcement schedule, in the context of gamification, has resulted in low engagement levels immediately following the reward or penalty, variable reinforcement schedule, as the element of surprise is activated, has produced higher engagement levels in the gamified context (Raymer, 2011, pp. 6-7).

Folmar (2015) considered the real power of gamification its ability to produce desirable behavior change. Some researchers have defined gamification from a behaviorist-scientific perspective: “Gamification is a designed-behavior shift through playful experiences” (Reiners and Wood, 2015, p. vi). Based on the variable schedule of the operant conditioning, not every positive behavior is rewarded. Consider for example how casinos function where players lose many times for the hope of winning once, yet they still come back to gamble (Nicholson, 2015).

In the next section, motivation and engagement are explored further to see how gamification can foster them.

Motivation and engagement

Motivation and engagement are two closely related concepts which often overlap in areas of intrinsic motivation and cognitive engagement (Dörnyei and Ushioda, 2011; Guthrie et al., 2012). Despite this strong link between motivation and engagement, the two terms are not synonymous and the presence of one does not necessarily dictate the presence of the other one. According to Brooks et al. (2012), motivation is linked to psychological elements that drive behavior and choice-making. Engagement, in the view of Russell et al. (2005), is an “energy” linked to different actions and tasks (p. 1). Appleton et al. (2006) highlighted the importance of both motivation and engagement in learning, but emphasized their separation as independent constructs.

Although the separation of motivation and engagement is an “ongoing issue” (Brooks et al., 2012, p. 548), there are some areas where the relationship between the two is nuanced. Griffiths et al. (2012) stated that engagement has evolved to include the psychological inner processes and the manifestation of that in human behavior in the form of task engagement, affective, and cognitive engagement. Willms (2003) emphasized the connection between psychological attitudes and the participation in school activities when
presenting an operational definition for engagement. Other scholars focused on the observable aspects of engagement such as the learners' behaviors, their effort and dedication in performing schoolwork, and their levels of participation and attendance (Ryan, 2000).

Motivation and engagement are sometimes distinguished chronically in occurrence. Intrinsic motivation and prior attitudes about learning can be a precursor to task engagement and increased participation. Participation could work in the opposite direction changing negative prior attitudes. The combination of strong motivation and high task engagement facilitated successful learning experience (Davis and McPartland, 2012). Engagement as an observable positive behavior (i.e. involvement in school activities) is driven by prior attitudes or as Ryan (2000) called them “beliefs” (p. 102).

Dornyei and Ottó (1998) presented a comprehensive definition of motivation as “the dynamically changing cumulative arousal in a person that initiates, directs, coordinates, amplifies, terminates, and evaluates the cognitive and motor processes whereby initial wishes and desires are selected, prioritised, operationalised, and (successfully or unsuccessfully) acted out” (p. 64). Motivation is divided by some researchers into five components: intrinsic and extrinsic motivation, task value, ability belief, and expectancies for success (Hsieh, 2014). Intrinsic motivation is triggered by human needs for mastery, curiosity, and overcoming challenges. Extrinsic motivation is relevant to elements not related to the task value such as rewards, grades, “performance and competition or evaluation by others” (p. 419). Task value is the perception and the value of the task by the learners and whether it is beneficial for them or not. Finally, expectancy for success is how the learners expect to perform in the future as they engage in a specific task (Wigfield et al., 2006).

Intrinsic motivation, according to Ryan and Deci (2000), is essentially and inherently present in every human being driving the desire for exploration, overcoming challenges, creativity, and most importantly, learning. They argue that contextual circumstances can ignite or subdue intrinsic motivational elements. Consequently, any successful game design need to address these important innates psychological needs. In the context of computer games, Malone (1980) presented a seminal study on the heuristics for designing instructional computer games. He posited that both elements of intrinsic and extrinsic motivation, which he called “fantasies” (p. 164), are necessary in the virtual game environment. However, he suggested more emphasis on the intrinsic motivational constructs which make learning activities self-rewarding and not connected to external rewards. Furthermore, Deci et al. (2001) reviewed a meta-analysis which concluded that extrinsic rewards have been found to undermine intrinsic motivation.

Engagement indicates the passion and emotional involvement in participating and completing learning activities (Skinner and Belmont, 1993). Kuh (2009) tracked the evolution of the engagement construct throughout history from meaning the time learners spend on task, to the outcome and achievement of learning, the quality of students' effort, student interaction and immersion in the learning experience, and finally, his own definition, the quality and effort learners invest in an authentic activity. Notice that the common theme among all definitions Kuh (2009) discussed is the visible aspect of engagement as it is manifested in the learners' behavior and the quality and time they invest in the learning task. However, to equal engagement to time on task is unfair in capturing the full scope of this term. Schlechty (2001) argued that engagement is not simply synonymous with time on task, but it is “the enthusiasm and diligence” in doing the task that makes the engagement a reality (p. 64). Csikszentmihalyi (1990) emphasized this connection between engagement in a task and the overwhelming deep involvement of the learners that transcends time and space.

**Connecting gamification to motivation and engagement**

In many studies, students' levels of engagement increased significantly following the introduction of game elements (Table II). The following inclusion criteria were followed in
the summary of literature review on gamification as illustrated in Table II. Literature included articles and conferences proceedings published after 2012. All of the studies selected employed elements of video games and any study that did not employ them was excluded. The studies were obtained through Washington State University library data system and some of them were made available through interlibrary loan network. In addition, some conference proceedings were obtained through Google Scholar. All the studies were examined carefully for theoretical foundations utilized in the study of gamification, the gamified content, the number and age of the participants, and the results.

Researchers who conducted empirical studies on the utilization of gamification elements agree on the positive effect on students’ engagement, motivation, and overall performance through instant feedback and collaboration (Kingsley and Grabner-Hagen, 2015; Leaning, 2015; Papastergiou, 2009; Seaborn and Fels, 2015; Koivisto and Hamari, 2014). Some authors proposed positive results showing higher likeability ratings when gamification features are introduced (Attali and Arieli-Attali, 2015). These results refer to how students felt toward the introduction of the game elements to the learning environment. Some studies showed no connection between students’ engagement and motivation and the introduction of gamification features to the learning environment (Hanus and Fox, 2015).

In a review of peer-reviewed empirical studies on gamification, Hamari et al. (2014) reviewed 24 studies, and stated that most of the studies yielded positive results of the

<table>
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Notes: *R, results; P, positive; N, negative; M, mixed. **The removal of gamification elements resulted in significant decline in participants’ motivation

Table II. Summary of literature reviews on gamification
The relationship between gamification and learners’ engagement. Seaborn and Fels (2015) reviewed 32 studies on the utilization of digital gamification elements pedagogically. Out of the 32 studies, 20 yielded positive results connecting gamification to increased levels of motivation and engagement. The remaining 12 studies yielded negative results showing no correlation between students’ engagement and introduction of game elements. Some empirical studies (Leaning, 2015; Berkling and Thomas, 2013) which produced negative or mixed results, focused on limited features of gamification, or forced the students to work with the game options available and failed to give them choice.

It is important when designing a gamified course fully or partially to create a challenge, when possible, that is appropriate to the level of the students to maintain their engagement (Nicholson, 2015). A complicated challenge can have reverse effect on engagement and cause a lack of interest, and even “anxiety and frustration.” (p. 13). Malone (1980) posited that an overly complicated challenge leading to failure in a game setting can damage one’s self-esteem and cause a lack of interest in reengaging the game. Nicholson (2015) divided engagement in the context of gamification into two categories: First, engagement in the form of interaction, cooperation, and altruism between the players (in a social manner). Second, engagement between players achieved through the utilization of game mechanics.

Francisco-Aparicio et al. (2013) argued that higher levels of extrinsic motivation when using gamification are not enough criteria to consider its benefits. The positive effects are usually temporary if not combined with principles from SDT: autonomy, competence, and relatedness (Nicholson, 2015). According to Zichermann and Cunningham (2011), one of the roles of educators is to help create circumstances that would allow for intrinsic motivation to be born. They posited that extrinsic elements, such as points and badges for example, could be used to lead to this outcome and critiqued not targeting intrinsic motivation in gamification design. If no permanent positive behavior change is created in the learners, the long-term effects of gamification cannot be fully evaluated. This can only be done using a longitudinal study that captures the long-term effects of the relationship between gamification and learners’ motivation and task engagement.

One of the steps in understanding the long-term effects of the gamification implementation in a pedagogical context is to combine, if data are available, the quantitative and qualitative design. Majority of the research done on the effect of gamification on engagement and motivation is either quantitative or described as mixed method design with humble portion of qualitative elements (Seaborn and Fels, 2015). Among the few qualitative studies on this topic was by Banfield and Wilkerson (2014) who conducted 96 semi-structured interviews reflecting positive learners’ experience with the introduction of gamification in the learning environment. Indeed, this conclusion regarding students’ positive perception of the systems that use game elements was also highlighted by Cheong et al. (2014).

Fun is one of the elements that attracts video game players to engage in playing activities and keep coming back for more. Gamification borrows from video games the element of fun not only to gain the learners’ engagement, but also to positively increase their motivation. In the next section, this connection between the component of fun in gamification and its effect on motivation and engagement is explored further.

**Emotions, fun, and play in gamification**
Gamification provides the component of fun that helps in transforming the students’ attitudes toward learning. Fun can allow for better learning, a concept that Prensky (2001) explained as he discussed the transformation in the learners’ attitude toward learning: “It appears that the role of fun in the learning process is to create relaxation and motivation. Relaxation enables a learner to take things in more easily, and motivation enables them to put forth effort without resentment” (p. 111). Mcgonigal (2011) discussed the essential role
of fun historically in the human experience. She refers to the story of the ancient Lydians who managed to live through famine on very limited rations distracting themselves from hunger through elaborate games on a state level.

Fun has been connected to gamification as one of the chief reasons for its utilization in settings which are considered mundane (Swanson and Ferguson, 2014). Video games, for many players, produce an emotional state induced by several factors, most important of which is fun. This feeling of fun is created in the players through their feeling of achievement, a sense of exploration, the reward of completing a level, or simply winning a game (Zichermann, 2010). If this element of play is incorporated into the learning experience, an intrinsic interest in learning can follow (Lieberman, 2006).

For many learners, the fun part in a gamified environment is the product of solving problems and overcoming challenges as they engage critical thinking skills. “Desirable difficulties,” as Yue et al. (2013) called them (p. 266), are important qualities, according to Lieberman (2006), in the process of learning. As learners exert their best effort and become mindful of these challenges, “close attention and intense mental effort lead to deeper understanding [and] learning” (p. 386). Hess and Saxberg (2014) posited that fun in the game environment originates from the nature of the embedded tasks which are challenging but doable.

In the game environment, players learn through play and get rewarded through digital trophies that represent a mastery of a skill. Hughes and Lacy (2016) argued that play is an appealing way to learn for several reasons. Play represent no pressure on the learners to meet a requirement or complete an assignment and is described as neither “coercive nor prescriptive” (p. 14). In many cases, learners show resistance to learning or lack of interest in the topic. Play can facilitate learning as it “lacks the bitter tinge of will-thwarting authority and thus engenders less resistance in the learner” (p. 14).

Learning through play does not mean that the learners are unconsciously learning through what is called as “stealth learning” (Kapp et al., 2014, p. 73). They elaborated that gamification works as a catalyst to discuss key learning points which should be clearly and explicitly stated and not require the learners to struggle to figure them out. The learners, they add, should be told about what they will be learning and should be asked about what they learned. Gamification cannot be understood holistically without the essential components of video games that can be incorporated into learning environment. In the next section, player types and game components will be discussed.

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**Players types**

*Player types*

The research about players’ types inform us about a proper gamified design for delivering pedagogical content. Bartle (1996) developed a test called Bartle’s Test of Game Psychology which categorized players according to their playing styles: “action vs interaction and world-oriented vs player-oriented” (p. 1). The test was adopted, recreated, and maintained by many game-design websites, such as GameDNA, and users have taken the test more than 800 thousand times (everthing2com, 2015). Based on this test, there are four types of gamers or players:

1. Killers: those who compete and play against other gamers.
2. Achievers: those who achieve status due to a high level of performance.
4. Socializers: those who are good team players and collaborate with others in the game environment.
Folmar (2015) commented in detail on the four types of players and how their needs should be considered in an effective pedagogical gamification design. He noted that killers rely on badges and points displayed on a leaderboard to gain public recognition in the game environment. Achievers track their achievements through badges and points and are keen to know the status of their progress. Socializers interact with others through mutual support. Finally, explorers are independent and are more interested in pursuing a quest rather than impressing others. Marczewski (2013) added philanthropists as the fifth kind of user types motivated by purpose.

Kim (2014) argued that this categorization of user types based on their motivation were loosely aligned with the learning styles of the students. It is not unusual, she argued, that a student might exhibit multiple characteristics such as achievement and interaction. However, this categorization could function as a guide in highlighting learners’ motivation and creating proper gamified design (Kim, 2014). The question here is how does this translate pragmatically for teachers in the field? For instance, if a student exhibits high motivation, appreciates recognition for achievements, and displays altruism, then the teacher could create a gamified design allowing for these characteristics to be realized. Consequently, the needs of the learners as the target group, in Kim’s (2014) argument, dictate the successful gamified design.

Bartle’s test was modified in 2010 to become pedagogically friendly (Farber, 2013). Kim (2014) changed the semantics to describe different learners and added verbs to reflect different methods of student interactions in the gamified environment which is similar to Bloom’s (1956) Taxonomy. These verbs can be used by teachers in the creation of lesson plans and activities. Some of these verbs created by Kim (2014) are: build, design, customize, challenge, explore, comment, and share. The meaning embedded within these verbs is intended to facilitate learning in the gamified environment.

In the following section, some digital gamification features will be discussed including: avatars, quests and challenges, badges, points and levels.

Gamification features

Avatars

Avatars are representative of players in the sense that they reflect their aspirations, vulnerabilities, and the different roles they play in life. Players need to choose or create their avatars as manifestations of their autonomy needs: “Avatar spaces indisputably involve choice in the creation of one’s avatar; there is substantial scope in which to exercise choice and create meaning” (Wilson, 2003, p. 2). Gee (2003) indicated that avatars mimic human identities such as parents, workers in different professions, religious or non-religious people, and different social classes. He referred to how gaming software allows the players to design their avatars with different costumes, powers, complexions, and in some settings, heroes or leaders as opposed to foot soldiers or workers. He added that avatar creation goes beyond segregation, racism, sexism, and many other social illnesses as it introduces virtual and fictional characters. Between the real and the avatar, lies a third “projective identity” where the real character projects its own aspirations and desires unto the virtual character (Gee, 2003, p. 55). Waggoner (2009) discussed the philosophy of representation in the creation of avatars. He cited findings showing that the real-world identities “continually informed” the virtual ones (p. 1).

Wilson (2003) created an elaborate definition of an avatar as a: “Virtual, surrogate self that acts as a stand in for our real-space selves that represents the user. The cyberspace avatar functions as a locus that is multifarious and polymorphous displaced from the facility of our real-space selves” (p. 2). Another definition that adds the real-life element to avatars as “models driven by humans in real time” (Bailenson et al., 2008, p. 78). Avatars represent an opportunity for players to venture into a risk-free world (Boss, 2009).
The freedom to choose or design their own avatars creates an atmosphere where students can “find their own voice” (p. 4). After choosing an avatar, the learners will be faced with the next challenge: to pursue a quest.

**Quests and challenges**

Quests are a series of challenges that require players to solve mystery engaging critical thinking skills (Whitton and Moseley, 2010). When students embark on a quest or accept a challenge, they engage in a story line that usually embeds a time-sensitive pattern. Quests and challenges give players a sense of direction or a purpose in a gamified environment (Zichermann and Cunningham, 2011). Adding story components or beginning a course with a form of a challenge are more engaging than a list of course objectives; both strategies recommended and applied by gamification proponents (Sheldon, 2011). Employing quests in this manner “provides context or activities that are used within games and adds them to the content being taught” (Kapp et al., 2014, p. 126). Quests and challenges support the sense of adventure and activate critical thinking skills by setting the exploration and discovery elements (Dale, 2014; Powers et al., 2013).

There are several learning elements unique to the gamified environment as it pertains to the quest or challenge story line (Kiang, 2014). In the virtual world of gamification, failure does not have the same negative connotations as in the real world. Consequently, the failure or death of an avatar character is a chance to contemplate, learn from mistakes, and restart again as the concept of failure is fragmented to small failed attempts. Kiang (2014) recommended that the teacher “try providing ways for the students to ‘fail’ frequently in many small ways, rather than in one big high-stakes test” (p. 2). In a gamified context, there is no single way to achieve success or accomplish a goal and students are empowered by this diversification or “flexibility dynamic [to] take a personalized path to success” (p. 2).

Quests can offer students the opportunity to work cooperatively and develop teamwork or they can choose to work individually where their achievements will “roll up to a group” (Zichermann and Cunningham, 2011, p. 65). This sense of unity is one of Gee’s (2003) 36 pedagogical principles called “affinity group” principle that the gamified environment fosters. He explained: “learners constitute an ‘affinity group,’ that is, a group bonded primarily through shared endeavor, goals, and practices and not shared race, gender, nation, ethnicity, or culture” (p. 212). This affinity group principle is manifested in many types of video games including massively multiplayer online games. These games typically support hundreds or even thousands of players coming from different geographical, social, and racial backgrounds contrary to the stereotypical image of a video game player as White, reclusive teenage male who is typically overweight (Bergstrom et al., 2016). The power of this virtual social environment can be employed allowing for learners to interact and collaborate instead of competing against other.

As players advance in the stages of their epic quests, they start gaining badges; one of the oldest game elements used to boost motivation and engagement.

**Badges**

Badges have a long history in many fields outside of gamification. Antin (2012) dated the history of badges back to 1911, where the Boy Scouts of America “understood the motivational power of goals, mastery seeking, reputation, and identity signaling with valued accomplishments” (Social Mediator, p. 3). Digital badges are a “validated indicator of an accomplishment, skill, quality, or interest that can be earned in various learning environments” (Grant, 2013, p. 1). In the context of education, badges are chosen in a gamified environment to accommodate different learners considering their motivation levels and capabilities (Abramovich et al., 2013). As students advance through different levels and
accumulate badges associated with different achievements, badges then serve as an “online record of a learner’s achievement” (Devedžić and Jovanović, 2015, p. 603).

According to Nicholson (2015), players who earned badges feel inner satisfaction as their status is announced publicly in the gamified environment. He added that badges not only serve as “signposts” signaling the players progress, but also indications of past achievements. Richter et al. (2015) argued that badges serve as a record of an individual’s past and present successes. On a social level, they added, badges establish the reputation of an individual in the game environment. Whether individually or socially, badges help enhance qualities such as “self-competence and self-efficacy” (p. 34).

Not only will badges represent the learners’ achievement, but also points and levels are important signs of their progress. (p. 10).

Points and levels
Points have a significant place in a gamified environment. Some game proponents consider points as an essential part of a gamified world or an “absolute requirement for all gamified systems” (Zichermann and Cunningham, 2011, p. 36). Attali and Arieli-Attali (2015) used points as the main gamification component that they included in their study of performance measuring fluency and understanding of math concepts. Gamification opponent Bogost (2011), critiqued the dependency on and exclusiveness of many gamified designs to points, which he thought were the least significant part of video games.

Rewards in the form of points are not necessarily permanent, contrary to what Zichermann and Cunningham (2011) stated: “Once you start giving someone a reward, you have to keep her in that reward loop forever” (p. 27). Rewards reinforce desirable learning behaviors and once these learning behaviors are established, rewards have no purpose. They have little effect on highly motivated learners and sometimes that effect could be negative. Nicholson (2015) stated: “As the subject will continue to use the skill for the real-world value, the rewards are no longer needed” (p. 3). He elaborated further on the idea that rewards do not work with everyone, certainly not for ones with strong intrinsic motivation: “This use of incentives to motivate someone to do something when they have no other reason to do so is a very common use of rewards and for tasks that do not require creative thinking, incentive program can improve performance” (p. 3).

Modern games usually have scaffolding techniques where players are introduced to simple levels to start with to encourage their progress. The players cannot advance to the next level until they have achieved mastery in the previous level (Kiang, 2014; Kolb, 2015). Players usually need “frequent rewards not penalties” as rewards signal skill mastery (Prensky, 2001, p. 135), although critics might think of this idea as limited to learners or players who are only driven by extrinsic motivation symbolized by virtual rewards. According to Zichermann and Cunningham (2011), we should not wait for the birth of intrinsic motivation. By creating conditions which are extrinsically motivating, “we shift the focus of responsibility from hoping it happens to a structure and process for making it happen” (p. 28). According to Hanus and Fox (2015), the groups of students who seem to be most engaged in a gamified classroom environment are low achievers or learners with weak intrinsic motivation. For those types of learners, “rewards and incentives might increase intrinsic motivation” (p. 160).

Sheldon’s case study and Quest to Learn school are some of the many examples of fully gamified learning experiences that will give help explore the gamification implementation.

Gamification in action: examples and criticism
The Sheldon case study
Sheldon (2011) gamified a college course by, among other strategies, assigning points to reward the students’ academic work who would advance in level as they accumulate
enough points. Sheldon (2011) considered his experiment as successful in promoting the students' engagement and improve their retention but with modest changes in their “overall performance” (p. 178). Sheldon focused on the non-digital aspects of gamification as he announced this in the introduction to his book (p. xiv). In Sheldon’s design, individual points carried less importance than scores. Sheldon(2011) assigned hundreds of points total for the gamified course activities he created. Kolb (2015) suggested that teachers engaging gamification points should be generous in using them where 100 points is no longer the equivalent of grade A. Sheldon tried to foster intrinsic motivation by incorporating gamification elements other than points and levels which are both symbols of extrinsic motivation. He established guilds where students can collaborate and manifest altruism in helping “guild mates” (p. 119). He expanded the concept of rewards to include knowledge and practice which he called “intrinsic rewards” (p. 166).

Stott and Neustaedter (2013) critiqued Sheldon's gamified design for “implementing game components by simply trading out the parlance of pedagogy for that of game culture” (p. 1). Sheldon (2011) overly focused on points and levels in his experiment as manifested in the multiple syllabi he presented for his courses. Lawley (2012) stated that going beyond surface characteristics of gamification, in reference to points and levels, is essential in the game design. She advocated creating an interactive game design which is aligned with pedagogical principles and conductive to collaboration. She added that a faulty or superficial gamified design can “damage existing interest or engagement” (p. 16).

In the next section, a more immersive gamified experience will be explored as in the Quest to Learn example.

**Quest to Learn**

Established in June of 2008 and funded by MacArthur and Bill and Melinda Gates foundations, Quest to Learn is a New York-based school that has adopted gamification and GBL throughout its entire curriculum from grades six to twelve (Quest to Learn, 2008). It is the result of collaboration between game designers from the Institute of Play (2007) and educators for the hope that this school will work as a model for other schools around the world. McGonical (2011) commended the process of learning in this unique and pioneer school: “It is how they learn that is different: students are engaged in gameful activities from the moment they wake up to the moment they finish up their final homework assignment at night” (p. 129). O’Keefe (2012) explained how the curriculum is designed as a result of coordination between the teachers and the game designers based the needs of the students. The school assignments are far from traditional and involve students facing different challenges and engaging in quests that start before the beginning of a school day. The creators of Quest to Learn commented on its mission: “Each trimester students encounter a series of increasingly complex, narrative challenges, games or quests, where learning, knowledge sharing, feedback, reflection and next steps emerge as a natural function of play” (Quest to Learn, 2008, p. 1).

The founders of Quest to Learn describe the learning experience in their school as “immersive” and “narrative-based” (Quest to Learn, 2008, p. 1). Craven (2015) emphasized the nature of gamification as an immersive experience which creates engagement for the user. This implies approaching the implementation of gamification holistically in a manner that incorporates effective elements such as quests and challenges. Reiners and Wood (2015) connected the immersive experience to story-telling elements in gamification where the “virtual environment for visualization” is activated (p. 316).

**Critique of Sheldon’s case study and quest to learn**

Stott and Neustaedter (2013) critiqued Sheldon’s gamified design for “implementing game components by simply trading out the parlance of pedagogy for that of game culture” (p. 1).
Sheldon (2011) overly focused on points and levels in his experiment as manifested in the multiple syllabi he presented for his courses. Lawley (2012) stated that going beyond surface characteristics of gamification, in reference to points and levels, is essential in the game design. She advocated creating an interactive game design which is aligned with pedagogical principles and conductive to collaboration. She added that a faulty or superficial gamified design can “damage existing interest or engagement” (p. 16).

There has been no independent evaluation of the Quest to Learn experience in terms of the principles and strategies inspired by gamification. The only accounts provided are what the founders of the pioneer school and the proponents of gamification provide. Consequently, a full evaluation of the Quest to Learn gamified experiment is not possible at the moment. Quest to Learn is privately funded school which would raise criticism in regards to the donors vested interest. The New York City (NYC) Department of Education survey (2015-2016) shared parents, teachers, and students’ responses in different areas related to Quest to Learn compared to NYC middle and high school percentage of positive responses. The survey was not directly related to the gamified strategies Quest to Learn has adopted but more focused on the overall school evaluation compared to NYC average. It showed that Quest to Learn was below NYC average in most areas such as rigorous and supportive school environment. However, when the students were asked to rate their learning experience, the positive response was higher compared to NYC average (Education, NY, 2015-2016).

The examples of Sheldon’s case study and Quest to Learn, in addition to many other gamification models and studies in business and education, are unique but not in the sense that they cannot be adaptable. In the next section, some of the guidelines for implementing gamification will be discussed.

**Implementation guidelines**

Some proponents of gamification suggested using 20 percent of class time for gamification following McLaughlin’s (2011) Google model where employees were given 20 percent of work time to do anything they were passionate about (Bruder, 2015). Between full gamification of the classroom and 20 percent quota suggestion, gamification is a tool to aid in achieving learning objectives and not vice versa. Employing game features, or any kind of educational technology, is not the goal at the expense of students’ learning.

Simões *et al.* (2013) suggested utilizing “distinctive characteristics of good games, particularly social games in order to understand what makes sense to apply to teaching processes” (p. 346). The principles to incorporate in gaming are intended to be “equally relevant to learning in video games and learning in content areas in classrooms” (Gee, 2003, p. 41).

Kolb (2015) outlined four principles necessary in any gamified design with learning content. First, she recommended that the learning objectives be well-stated and explicitly presented prior to engaging gamification elements, and preferably embedded within the gamified design. Second, she highlighted considering practical steps when applying gamification design in the learning environment, such as the use of reliable gamification software that allows for full deployment of gamification features. Few companies produced that kind of software such as 3DGamelab, Gradecraft, and Classcraft. Third, game designers and educators. According to Kolb (2015), need to prepare quests to increase motivation and engagement. Fourth, the gamified design should allow for modding (shortened from modification). Modding, in a gamified context, means to allow users to make their own game choices. Students should be empowered to choose their own avatars, create quests, and decide to engage the gamified content individually or by working in teams.

Research has shown that intrinsically motivated students experience gradual disengagement and loss of motivation when forced to use game features (Hanus and Fox, 2015). Gibson and Jakl (2015) connected choice in the gamified experience to the
autonomy of self-directed learning. Autonomy as one of the three principles of SDT is connected to intrinsic motivation (Nicholson, 2015). He added that allowing the learner to make choices in the gamified experience will allow for meaningful gamification to happen.

According to Gee (2003), the game design elements should allow for collaboration and team work through the use of leaderboards or “guilds.” Zhang and Clear (2015) emphasized that any successful gamified design need to support collaboration among the students. They added that successful gamified designs which incorporate collaboration help the emerging of positive learning behaviors. Kim et al. (2015) stated that as the players collaborate, they “engage in a shared, relevant, goal oriented activity” (p. 333).

Successful game design allows the players to try multiple times to achieve success. In the gamified environment, failure is redefined where it is no longer a set back but rather “an opportunity to learn from mistakes and correct them” (Hanus and Fox, 2015, p. 3). Research showed that players who received constructive feedback following failure in the gamified environment expressed positive emotions about their experience (Herzig et al., 2015). Gee (2014) considered failure in the gamified world as a “path to success” (p. 186).

Researchers suggested studying the deployment of full game features over a longer period to evaluate its full potential (e.g. Attali and Arieli-Attali, 2015; Hanus and Fox, 2015; González et al., 2016). Employing limited game features in isolation to an existing course may not produce desirable or measurable effect (Whitton and Moseley, 2010). The limited use of gamification in the form of employing some features of games into the learning experience produced mixed or adverse results on performance and motivation (Attali and Arieli-Attali, 2015).

Researchers who engaged the learners with limited game features reported the participants asking for more elements of gamification (Papastergiou, 2009). There is strong evidence to suggest a direct link between the effective use of gamification elements and meeting basic psychological human needs. Many of these needs are connected to SDT. Francisco-Aparicio et al. (2013) highlighted the importance of a gamification design that meets the inner psychological needs of the learners. These inner psychological needs intersect with principles of SDT of relatedness, competence, and autonomy. For example, relatedness, according to Francisco-Aparicio et al. (2013), could be supported by online interaction and collaboration. Competence needs, in their view, can be supported through “practice activities” (p. 183). They posit that offering learners choices and allowing them to take control in the gamified environment fulfills the autonomy needs.

When presenting her proposed guideline for a full gamified experience, Kolb (2015) suggested allocating 10-25 minutes for each traditional assignment to be transformed into a quest in the gamified environment. This length of time for quest development, among other gamification components, might not be practical for many teachers.

Although many teachers, as Gee (2003) suggested, are gamers themselves, they are often reluctant to use methods not directly related to their professional practice. Many teachers have no difficulty introducing game elements into the classroom with the help of supporting and useful software such as Classcraft, for example. Watching the software tutorials and experimenting with it is not beyond the skills and abilities of many teachers. Lee and Hammer (2011) argued that gamification can give teachers the necessary tools to direct and motivate their students transforming the learning experience into a joyful one.

Conclusion and recommendations
Between the zealots in support of full gamification of the curriculum and the educational system and opponents who think gamification is a distraction from the learning objectives, there remains a need for further exploration of the full impact of gamification on engagement and motivation. Further empirical research need to be conducted to examine the potentials of gamification. In addition to deploying full gamification features to study its impact,
longitudinal studies need to be conducted in order to develop a full understanding of the effect of gamification on the learners’ engagement and motivation. There is a need to research the most effective components of game elements that could create proper conditions for the birth of intrinsic motivation. Furthermore, the learners’ perceptions of the gamification intervention need to be researched using mixed method design to help understand the relationship between gamification, engagement, and motivation in a holistic way.

In order to achieve a full understanding of gamification, a proper research design should capture both quantitative and qualitative data sources. Research on this area is overly focused on quantitative data, such as surveys and game metrics, and the qualitative elements, such as observations and interviews, are either marginalized or absent. Consequently, the second article in this series will propose a balanced research design and the argument behind its validity. Finally, an empirical meta-inference study will follow on the effect of gamification in increasing students’ motivation and engagement in three college courses.

The determining effect of context is essential in the implementation of gamification. Differences among sites, content areas, instructor’s characteristics, and implementation differences need to be considered in any gamified design. In addition, variations among students: readiness and willingness characteristics, prior experiences and exposure to video game elements, and willingness to engage can determine the success or failure of any gamified event. Finally, the effects of the contextual differences on students’ learning opportunities may cause variations in the degrees to which a successful gamified experience is created. The empirical study concluding this series might shed more light on the determining effect of context.

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Further reading


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