

Gamification: Game –Based Methods and Strategies to Increase Engagement and Motivation within an eLearning Environment

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Abstract: Gamification integrates game elements into educational content in order to promote motivation and engagement. Before exploring gamification, games need to be dissected in order to better understand game elements which are used to create a gamified eLearning environment. Games have been used in education in order to engage and motivate learners. In order to fully understand how gamification ties into games and learning, this paper will first explore games for learning and how they affect engagement and motivation. Next, gamification and learning will be discussed, and finally, instructional design with gamification will be explored.

Introduction

Gamification in education can be described as incorporating game elements into a learning experience to make it more engaging and appealing (Muntean, 2011). Games and gamification have been used in classrooms to increase motivation and engagement (Facer, Joiner, Reid, & Kirk, 2004; Kapp, 2012; Malone & Lepper, 1987; Prensky, 2001; Raymer, 2011). Games must be explored before gamification because “gamification is the use of game design elements in non-game contexts” (Deterding, Dixon, Khaled, & Nacke, 2011, p. 10). In order to fully understand how gamification ties into games and learning, this paper will first explore games for learning and how it affects engagement and motivation. Next, gamification and learning will be discussed, and finally, instructional design with gamification will be explored.

Games for Learning

Games are most valuable when they are personally meaningful, experiential, social, and epistemological all at the same time (Shaffer, Squire, Halverson, & Gee, 2005). They are not toys because games can create new social and cultural worlds where people learn by integrating thinking, social interaction, and technology. When games are critically played, “they situate meaning in a multimodal space through embodied experiences to solve problems and reflect on the intricacies of the design of imagined worlds and the design of both real and imagined social relationships and identities in the modern world” (Gee, 2003, p. 48). Games are a powerful tool because they make it possible to develop situated understanding and let players inhabit roles that would have been impossible otherwise (Shaffer et al.; Gee, 2005). These experiences may make players smarter and more thoughtful because the user can feel like an active agent not just a passive recipient (Gee, 2005). In fact, when players are involved in active learning, they are experiencing the world in new ways, forming new affiliations, and preparing for future learning (Gee, 2003). In addition, games empower learners and help participants acquire problem solving skills along with developing understanding (Gee, 2005).

Learning by Doing

Even though users are learning while playing, they do not have to be consciously aware of it (Gee, 2005). “There is nothing mindless about mastering a video game. The games demand skills that are complex and differentiated. Some of them begin to constitute a socialization into the computer culture” (Turkle, 1984, p. 67). Instead of being told the rules in advance, players must figure them out by observation, trial and error, and a process of hypothesis testing (Greenfield, 1993). In order to accomplish this, participants must use their cognitive process

and inductive discovery, which is the process individuals use to learn about the world in order to decode the rules (Greenfield, Camaioni, Ercolani, Weiss, Lauber, & Perucchini, 1994). Greenfield et al. noted knowledge is acquired as a result of the inductive experience of playing. Players must form their own hypotheses from their own experience and test it out because inductive discovery is crucial to master the game. Therefore, players must play games by themselves in order to learn and gain the full experience.

Engagement

Engagement is “occupying the attention or efforts of a person” (Raymer, 2011, para. 3). When players are truly engaged, they are wanting and liking, having fun, ambition, drive, affection, and delight (Tom Chatfield, TEDGlobal, 2010). In a game, engagement is gained by rewarding players with experience, in-game currency, and items of varying rarity. Developers mathematically figure out how often these rewards are given in order to keep players’ interested and engaged. Tom Chatfield listed seven things to incorporate outside the games in order to keep people engaged: experience bars; multiple long and short-term goals; rewards; no punishment for failure; rapid, frequent, clear feedback; an element of uncertainty; windows of enhanced attention; and collaboration. All of these elements are outside of games and keep people engaged. Prensky (2001) explained why games engage people: they are fun, a form of play, interactive, adaptive, have rules, goals, outcomes, win states, conflict/competition/challenge/opposition, problem solving, and use representation with the story. Players experience intense emotional rewards both individually and collectively while playing a game. They experience an intense and passionate involvement while satisfying their need for structure, something to do, learning, ego gratification, adrenaline, creativity, social groups, and emotion.

Facer, Joiner, Stanton, Reid, Hull, and Kirk (2004) conducted an exploratory study on a mobile game called Savannah to see if it kept players engaged and self-motivated in order to learn the content. The game consisted of a virtual Savannah world where participants explored it using a global positioning system (GPS), headphones, and personal digital assistant (PDA). The PDAs would play sounds, display images of the environment and animals, tell players about smells, display energy bars, attack options, and feedback. The feedback would let participants know if they were too hot, hungry, or died. In addition, the players had to learn how to work together in order to overcome certain situations and each decision would affect if they survived or died. The researchers discovered that participants felt like they were actually lions in the Savannah and found the game highly engaging. Engagement was evident because players talked as if they were directly experiencing the simulation.

Motivation

Games are inherently and intrinsically motivating (Connolly, Stansfield, & Hainey, 2011). They provide fun, pleasure, and intense emotional rewards (Prensky, 2001; Tom Chatfield, TEDGlobal, 2010). Users are motivated to play games to achieve goals, socialize, escape reality, discover new worlds, role-play, and customize their character (Nick Yee, 2006). According to Malone and Lepper, intrinsic motivation produces higher levels of sustained interest in the activity and better learning of the instructional content. “We define an activity as being intrinsically motivating if people engage in it *for its own sake*, rather than in order to receive some external reward or avoid some external punishment” (Malone & Lepper, 1987, p. 229). The researchers broke down intrinsic motivation into four classes: challenge, curiosity, control, and fantasy. Malone and Lepper revealed how games also promote intrinsic motivation by stimulating players’ curiosity, giving players the feeling of contingency, choice, power, and provide an emotional fantasy experience. In order to further provoke intrinsic motivation, games must have multiple levels of goals, hidden information, and random elements. “Motivation for humans lies in challenges that feel challenging, but doable and in gaining continual feedback that lets them know what progress they are making” (Gee, 2005, p. 14). Feedback needs to be personally meaningful, frequent, clear, constructive, encouraging while engaging, and enhance participant’s self-esteem in order to intrinsically motivate players (Gee, 2005). Games also trigger interpersonal motivations, which include cooperation, competition, and recognition. Interpersonal motivations provide players with the opportunity to work together, compete with others, and receive social recognition.

Gumulak and Webber (2011) conducted a qualitative case study to find out what motivates young people to play video games. They discovered users play games because they are entertaining and challenging. The participants told the researchers they felt like they had learned something from gaming including skills with real-world applications, such as lighting a fire, hand-eye coordination, problem solving, and academic knowledge. The

majority of participants wanted to play games to be better at them and be able to do things that were otherwise impossible. Some of the players even picked out long and difficult games because they felt excitement and achievement when they overcame the challenges. Finally, learning and literacy were evident because the players used the text within the game to solve problems and make sense of what was going on. If the participants experienced issues, they went on forums, read books, searched the Internet, and talked or texted friends. The majority of them preferred to work hard, read, reflect, and go back to the same level until they overcame the challenge.

Gamification and Learning

Games involve a system or space with players, an abstraction of reality, a challenge, rules, interaction, give feedback, have a quantifiable outcome, and involve an emotional reaction (Kapp, 2012). Gamification, on the other hand, is the use of game elements, design, aesthetics, and game thinking in content to promote motivation, engagement, learning, and problem solving (Deterding et al., 2011; Erenli, 2013; Kapp; Simões, Redondo, & Vilas, 2013). Due to the confusion between gamification and games, Kapp pointed out what gamification is not: stand-alone game; very little art-styles, theme, application of narrative; trivialization of learning; foreign to learning professionals; perfect for every learning situation; and only game mechanics (Kapp, 2012; Raymer, 2011). Instead, gamification takes the “possibility spaces” and expands them to other areas, such as education to engage learners, motivate them to learn, and enhance their achievements. One of the goals of gamification is to raise people’s engagement by incorporating game elements such as badges, points, and leaderboards into the task to make it more interesting and appealing. Because of this, people feel more ownership and purpose while interacting with the task (Muntean, 2011). The idea behind gamification in education is to extract game elements that make video games fun and exciting and adapt those elements into the course design without using actual games.

Creating a gamified course that promotes student motivation requires a deep understanding of what makes people engaged in videogames (Dominguez, Saenz-de-Navarrete, De-Marcos, Fernández-Sanz, Pagés, & Martínez-Herráiz, 2012). Gamification is not an easy to create because it requires deep thinking about the whole learning experience rather than focusing on the elements solely (O’Donovan, Gain, & Marais, 2013; Kapp, 2012). Nicholson (2012) noted that designing meaningful gamification should meet the needs and the goals of the user. Well designed gamified content can be engaging and enhanced motivation because they tap into the cognitive, the emotional, and the social areas of the players (Lee & Hammer, 2011). The cognitive area is enhanced through rules that facilitate multiple routes for exploration and discovery; the emotional effects are attainable through the rapid cycles of feedback that reframing failure as a step to learn and success; the social area is tapped by the recognition of achievements and meaningful interactions among students (Lee & Hammer, 2011).

Part of designing a gamified course is understanding game mechanics. Game mechanics include rules which control what a play can and cannot do. Cook (2006) defined game mechanics as “rule based systems/simulations that facilitate and encourage a user to explore and learn the properties of their possibility space through the use of feedback mechanism” (para 3). There are five types: physics, internal economy, progression mechanisms, tactical maneuvering, and social interaction (Adams, Dormans, Joris, & Safari Books Online, 2012). Game mechanics also include levels, badges, points and many other elements that work according to specified rules (Kapp, 2012). The mechanics also provide learners with an engaging experience that lead them to accomplish their goals through immediate feedback and constant interaction.

Goals and Objectives

Goals are what distinguish games from other types of play; reaching goals is the overall motivation of playing a game (Prensky, 2001). Generally, goals and objectives are in the beginning of the game which causes players to be motivated to play in order to satisfy the goals and get to the end (Prensky, 2001; Kapp, 2012). The introduction of goals adds meaning, purpose, and measurable outcomes to the game (Kapp). There are various layers players must achieve which include a long-term goal of completing the game, medium-term goal of completing the levels in the game, and the short-term goal of completing the missions in the levels (Raymer, 2011). These layers get more difficult as players move from short-term to long-term goals. Games are structured this way in order to allow players to learn and practice their skills before demonstrating their mastery of those skills in the most difficult parts of the game. Raymer stated eLearning courses need to be designed in the same manner to minimize cognitive

fatigue. This allows participants to learn skills and knowledge incrementally and practice their new skills and knowledge before demonstrating their mastery just like games allow you to do. O'Donovan et al. (2013) and Sillaots (2014) found that dividing the goal into sub-goals was an efficient mechanism in gamified eLearning courses. This division enables students to attain incremental achievement and motivates them to work towards the main goal.

Feedback

Immediate feedback is what characterizes games; it lets the player know when something in the game is changed in response to his/her action, which is called “interactivity” (Prensky, 2001). Effective feedback is central to the efficacy of learning. Without feedback built into the content or the game, participants get lost or confused. The frequency and the intensity of the feedback are two fundamental features of games over learning environments (Kapp, 2012). Through feedback, players are involved in continuous cycles of learning to learn the game itself, how to succeed, and how to get to the next level (Prensky). Raymer (2011) elaborated on feedback by saying it should include through scrutiny on the navigation within eLearning because participants should know exactly what they need to do next or what options are available to them. In addition, designers need to keep in mind that assessments should give a specific feedback instead of “Try again” in order to support information transference.

In games, feedback can take many forms, numerical scores, graphically, or even orally. Similarly, feedback in gamification takes different forms using many game elements. Visual cues are used to guide students on their task (O'Donovan et al., 2013). Badges and leaderboards are used as marks of accomplishment (Denny, 2013; Domínguez et al., 2013; O'Donovan et al.; Sillaots, 2014). The progression bars are used to determine how close students are from their goals (O'Donovan et al.). Numerical scores are used to evaluate student progress (O'Donovan et al.; Sillaots, 2014). Character upgrades is one of the method of showing participants their progress. As participants level up, their character would change, and they are able to get new outfits and accessories. This method of feedback would tap into participant's natural instinct to collect items which, in turn, would engage and motivate learners (Raymer, 2011). Chen., Chao, Chao, Hsu, and Teng (2013) revealed that the level-up mechanism using educational agents enhanced students' motivation in terms of attention, relevance, and satisfaction. Taking everything into consideration, feedback in the form of messages, progression bars, and character upgrades are essential components of developing games and gamification. Designers also need to come up with ways to recognize the participant with rewards or achievements.

Rewards

Rewards are the representation of having accomplished goals. “Video game achievements are task-reward systems that usually reward the player with points, unlock bonus in-game material or simply exist as status symbols” (Fitz-Walter, Tjondronegoro, & Wyeth, 2011, p. 122). When designers create a course, Raymer (2011) recommends to recognize participant's efforts by creating a reward schedule in proportion to the effort or risk. If the reward is too easy, players will get bored because motivation lies in challenges that feel hard yet doable (Gee, 2005). Rewards play an important role in games but should not be the focus of the gamification (Kapp, 2012). Rewarding in gamified system fills the basic desire of the learners and give them the feeling of achievement. It also helps to make the course more interesting, challenging, and provides a measure of status. Rewards can be represented in many forms: e.g. badges and trophies can represent students' status (Denny, 2013;), leaderboards can encourage students' competitions (O'Donovan et al., 2013), and points that can celebrate students' progression. The incorporation of game elements appeals to every student differently. For example, leaderboards encouraged some students to compare their progress with their peers; however, it discouraged others due to the feeling of competition (Domínguez et al., 2013; Sillaots, 2014). This may suggest that leaderboard can be tied to collaboration activities beside competitions to entice different tastes.

Instructional Design with Gamification

“Instructional design is basically a series of steps to identify needs, state those needs in a usefully precise way, and align elements of content to address those needs, as well as assess the outcome” (Quinn, 2005, p. 25). Quinn (2005) illustrates steps in the instruction cycle. The first step is to give the concept, and then, providing examples for that concept. Finally, the educator should give time for practicing and reflection which links the practice back to the concept. For the participants, they need to start with an initial understanding, have a goal, formulate a plan, execute it, obtain the feedback from the action, and update their understanding (Aldrich, 2004).

Aldrich's and Quinn's steps are part of the core elements that contribute to successful learning. Quinn (2005), outlined these core elements as: contextualized, clear, appropriate challenge, anchored, relevant, exploratory, active manipulation, appropriate feedback, and attention-getting. All of these elements were also part of gamification and game mechanics. The game provides information about the situation, with anchored and relevant challenges, goals, and choice of actions, manipulation, and attention-getting feedback. These elements provide a great template for creating and implementing effective gamification in the classroom.

Instead of playing a video game in the classroom, there is an option to make the course itself as a game. Lee Sheldon (2012) made turned his classroom into a game. The researcher started by changing the normal grading scale to a leveling, experience points, and letter grade scale. For instance, at level one, the players would have zero experience points which translates into an "F." As they complete assignments and gain experience points, they would level up. In addition, he made the course as a massively multiplayer online role-playing game (MMORPG) in a real-time environment. In order to make players feel like they are immersed in the game, game jargon can be used. For example, quizzes could be called "defeating monsters," writing papers can be "crafting," and assignments are called "quests". Some of these quests could be solo, group, or guild depending on the assignment. If the assignment used group situations, the players would be given a peer review secret ballot to rank their group members. The ballot had guild leader for 100 points, raid leader for 75 points, solid guild crafter for 50 points, needs rez for 25 points, and waste of rations for zero points. Also, the assignments could have player versus environment elements along with player versus player. Sheldon also let the players pick their name in order to keep students engaged. These are just a few examples of game elements used to make a course into a game. Many game elements can be used to gamify a traditional or an online course.

In conclusion, games have been proven to increase engagement which in turn increases motivation and achievement. Gamifying a course requires a deep understanding of games. The designers must have knowledge of video games for learning, engagement, motivation, achievement, gamification, and game mechanics in order to create an effective gamified eLearning course. It is not an overnight process, and in most cases, can take a very long time to develop. But, in the end, gamifying a course is worth it because students will find it fun, more exciting than traditional methods, immersive, a way to develop a new identity, a way to collaborate and compete with others, and a way to receive recognition for their progress.

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