Problems and Possibilities of Gamifying Learning: A Conceptual Review

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This article presents a brief overview of the concept of gamification and examines and compares gamification with edutainment and game-based learning. The paper theorizes that gamification in its current industry-driven conceptualization will not work when implemented in educational arenas, and that to be examined and used within educational frames, gamification must be re-examined and re-conceptualized.

The 2014 New Media Consortium Horizons Report, Higher Education Edition (Johnson, Becker, Estrada, & Freeman, 2014) indicated that gamification and games in learning environments are quickly becoming an important development in educational technology, positing that these trends will become more mainstream within a two to three year adoption period. Gamification, the use of game thinking and game mechanics, is used to engage audiences and solve problems. As a growing trend in industry, it is also quickly gaining traction within educational arenas (Deterding, 2011; Kapp, 2012; Zicherman, 2011).

Gamification, in its current conception, is a relatively recent trend/phenomenon emerging from the commercial videogame industry, which is a billion dollar industry that supersedes the music and movie industries. Due to the major success of videogames in today’s culture, with as many as 97% of today’s youth reported as playing videogames on a regular basis (Lenhart, et. al, 2008) and the age of the average gamer hovering around 30 years of age (Entertainment Software Association, 2013), scholars and industry leaders have begun to examine what makes these environments so engaging and have attempted to take these elements and create experiences for their customers, clients, or patrons.

Defining Gamification

As explained previously, gamification is the use of game thinking and game mechanics in non-game situations, but what exactly is game thinking and game mechanics? It is important to note that many game designers and researchers agree that gamification is more than points and leaderboards, and that certain elements and traits must be considered and included when gamifying a system (Bogost, 2011; Layne, 2011; Nicholson, 2012; Schell, 2010). Too often, companies and entities go forward with attempting to use gamification and they end up putting a glossy veneer of points and badges on a product (website or idea) that is possibly an undeveloped or underdeveloped process or idea, leaving some of the best traits of gaming, such as narrative and immersion, out of the experience (Schell, 2010). Many games scholars criticize gamification because of the simple focus on the points and scoring system, and lack of focus on the more nuanced meaning and engagement that games can generate.
and immersion are important concepts to consider for those who are examining the important game elements and mechanics that they plan to embed in their gamified experience.

**Ownership and Immersion**

Many game scholars and game developers agree that the elements of what makes a game good, should also be considered and embedded in a truly gamified experience--be that a formal school learning experience or a business and commerce experience. Games are rule based systems, not free play systems, so there will always need to be some structure to the environment in which the gamification experience is being employed, however, as stated above it must move beyond the points and leaderboards and should include elements that allow gamers to become immersed in the experience, and take ownership of what they are doing in the gamified experience. The ownership and immersion in gaming situations, through the concept of situated and embodied learning--learning that allows one to experience the event and activity--is also typically tied to the projective identity that a gamer develops within a game play experience, which allows the gamer to interface between his/her real-world identity (involving morals, ideals, etc) and the in-game virtual identity (pre-programmed traits, abilities, and controls) of the avatar (Gee, 2007). Ownership and immersion are important concepts to consider for those who are examining the important game elements and mechanics that they plan to embed in their gamified experience.

**Narrative and Quests**

What ownership and immersion ultimately mean for the gamification of programs, websites, and products is that motivation and desire to participate must be inherent in the design. Good narratives, quests, and missions can allow this to come to fruition. Just as games drop gamers into a quest or a setting where they immediately feel useful and motivated to succeed, so too must gamified experiences. This is often done through providing a quest or mission to the players, thus giving them something that they can immediately begin to experience and work through. As Gee (2013) mentions, humans are really good at telling stories and working through narratives. According to Gee all life is a story and through story history gets told.

In gaming, this concept of narrative and story is tapped into when the gamer owns his or her experience as the story unfolds through game play. Salen and Zimmerman (2004) state the importance of narrative within gaming environments as, "Playing a game means interacting within a representational universe, a space of possibility with narrative dimensions" (p. 378). These narrative dimensions are directly tied to the concept of story that Gee (2013) indicated is so very important to life and history, which can also be suggestive of working closely with the concepts of ownership, immersion, and identity, thus also indicating that narrative is also tied to personal experiences and may be different for different players depending on their...
problems and life experiences. Salen and Zimmerman (2004) suggest that good narrative structures within games provide tensions and poses problems in order to put players in a variety of situations and events, all through the personification or characterization of the event(s), and then move the player through various levels that allow gamers to progress through the game towards a resolution.

The concept of narrative is further solidified and instantiated through a feedback loop (Abrams & Gerber, 2013; Salen & Zimmerman, 2004), which is a systematic and iterative portrayal of one's progress in a gaming environment.

The Feedback Loop

The feedback loop is provided so that individuals can see and understand how their actions and movements impact their game play experience. From this information, players can then make changes that allow them to become more successful in the given game environment in which they are playing or experiencing. The feedback loop is made up of multiple elements, and Abrams & Gerber suggest that the four most powerful elements of the feedback loop when used in learning environments--be they educational or entertainment--are the objectives, health/life bars, in-game maps, and leaderboards. Objectives tell players what their mission is or what they are supposed to do. Health and life bars keep players informed of how many lives they have left, or how close they are to dying. In-game maps allow players to see where they are in the game world, as well as give players an indication of where the key areas are in the game, or where their enemies or other players might be located in relation to their current in-game location.

Leaderboards can be personal leaderboards or game leaderboards, and allow players to see their personal strengths and weaknesses within the game, as well as how they compare to other players. These elements work together in an iterative fashion, providing gamers with information as-needed and just-in-time so that they can make the decision that will result in the best situation for their current needs in the game. Good games provide players with a tutorial that allows them to understand through the feedback loop. What this means is that as a player begins a game, he or she begins to assume the character or avatar that they are representing (in the case of many games, but not all), however, during this process their play experience is mediated by a feedback loop that is gradually allowing the player to learn the proper mechanics of play, including the game controls, and getting into the storyline and understanding the objective for their mission. The game tutorial may also seem to be different from a traditional tutorial one would receive in a class or lesson, because the game tutorial often is actual game play that has a direct impact within the game, allowing the player to begin gaining and accruing points, or XP (experience points).

Power of Crowds

While not necessarily a required element of all games, often gamification is combined with crowdsourcing, using collective intelligence to solve complex problems and create solutions to mysteries (problems that scientists and researchers have pondered for some time). However, what should be noted is that all games are inherently social events. Games and gamers, whether the game is a single player game or massively multiplayer game, are built around communities of fans...
and players who engage in dialogue and discussion about their favorite game. This concept of the social gamer is powerful to consider when thinking through elements to build into gamified experiences.

Crowdsourcing is one such element that when brought into gamified experiences can be used for promoting social learning and socialization that often surrounds game environments. Crowdsourcing is often used in such a way to tap into the collective intelligence of a group and bring lots of minds together to think through problems. To engage players in crowdsourcing in such a way that it matches the highly social and collective intelligence nature of gaming affinity spaces, yet also matches the need of the gamified experience, it is important to ensure that the crowdsourcing experience that is being created has a real-world impact and connection. It is helpful in these instances if the player can see that what he or she is doing actually is making a difference in the real world.

Properly gamified experiences should improve the user experience (Deterding, 2011; Nicholson, 2012). Including elements that improve ownership and immersion, narrative, feedback loops, and crowdsourcing, move beyond the simple concept of badges and points and bring a deeper experience to the players who are participating in the gamified experience. However, it is important to note distinctions within gamification, and understand the nuances of gamification, game-based learning, and even edutainment.

Game-based Learning and Edutainment

Before going further into exploring how elements of gamification can be used within educational context, a deeper exploration of the nuances of how games in general are used in educational contexts. Gamification is not edutainment, nor is it games-based learning. Often it seems that the spaces of edutainment and games-based learning get mixed up in discussions dealing with gamification and people use the term interchangeably when they are discussing separate concepts of edutainment and/or game-based learning. These three concepts (gamification, game-based learning, and even edutainment) inform one another, however, it is important to note that gamification is a system that is used within the design of a product or curriculum and it can occur within edutainment and game-based learning. However, it is important to note that gamification is not dependent upon either game-based learning or edutainment to be developed on its own, nor does gamification as a system need to be employed within game-based learning or edutainment.

Edutainment

To explain further, edutainment was defined in the 1980’s as the use of entertainment devices or activities to teach school-based and education subjects or concepts. A Jeopardy-style game created about the Renaissance period, Math Blaster, Where in the World is Carmen San Diego? and Oregon Trail were all examples of edutainment that have been used in schools. Often, but not always, edutainment includes flashy products created for the sole purpose of teaching a concept. Some edutainment products are more effective than other edutainment products, however, one thing that should be noted is that edutainment products generally are met with disdain from students as nothing more than a glorified worksheet or activity that has been put into an electronic format (Zichermann, 2011). When this
happens, students subsequently reject the lessons that they are being presented. In fact, Zichermann pointed out that the last time that students and teachers agreed that edutainment was enjoyable was in the early 1980’s with the game *Where in the World is Carmen San Diego?* and *Oregon Trail*. According to Zichermann, four billion dollars have been spent on edutainment since the days of *Where in the World is Carmen San Diego?* and not a one of the games has been successful in capturing students’ attention as a valid gaming and learning experience. He attributes this to teachers and parents getting involved in the design of the products and removing any of the elements that made it a fun game-like experience.

**Game-based learning**

In a more recent trend, scholars have examined how a concept called game-based learning, which is learning through videogames, often commercial-off-the-shelf videogames (COTS) such as *Minecraft*, or serious games (games created that serve as simulations of real world events that have problem solving elements embedded) can be used to enhance student learning in class-related activities (Abrams, 2009; Gerber & Price, 2011; Gerber, Abrams, Onwuegbuzie, & Benge, 2014; Steinkuhler, Compton-Lily, & King, 2011; Squire, 2011), as well as have examined how these games impact a player’s learning in out-of-school spaces (Gee, 2007; Gee & Hayes, 2011).

In game-based learning experiences, videogames, either COTS or serious games, are brought into classroom learning, or after-school spaces and tied in with standards or learning objectives. In a study conducted by Gerber, Abrams, Onwuegbuzie, and Benge (2014), they designed a reading intervention class in a low performing inner-city school with students who were English Second Language Learners. In their 18-week mixed methods study, they incorporated a modified reading workshop, in which students self-selected COTS videogames from the classroom library, engaged in game play of these games during class, selected reading material and engaged in peer and teacher conferencing. What they found was students engaging in a constellation of connections among various literacy elements, leading them into inter-textual and cross-literate meaning making. The students exhibited growth in their reading and writing habits, attitudes, and this was evidenced by increases on their state tests in reading and writing. Within game-based learning environments students often exhibit growth or increased engagement with the topic of study.

While game-based learning and edutainment are not synonymous with gamification, as mentioned previously, they all inform one another. However, one of the barriers that educators must overcome when considering bringing gamification into classroom environments is that gamification originally began as a method used in business and industry to increase productivity among workers, increase revenue in selling products, to gain new clients, and to retain existing clients. While there might be parallels in using gamification in industry and the classroom, educators, curriculum developers, and policy makers must exercise caution when bringing the same gamification concepts into learning situations that are used in industry situations, and they must fully explore both the affordances and constraints of gamification. This next section explores the perils and promises of gamification when concerned with its adoption into education and learning environments.
Translating Gamification to an Educational Arena

Perils

As stated above, when schools got a hold of the concept of using entertainment to educate, the idea of edutainment was born and has since received mixed reviews (Layne, 2011; Schell, 2010; Zichermann, 2011). In part, this is because some of the worst elements were the ones that the developers of edutainment focused most on—teaching of discrete skills without using proper game mechanics to make the idea engaging. In a sense, edutainment became the digitizing of worksheets. Gamification has the risk of heading down that path if the focus continues to remain on the "worst" part of games, that being the point system and leaderboard (Schell, 2010). Additionally, because of the point system, it has been argued that the motivation to participate will remain extrinsic and intrinsic motivation will cease to exist due to it never having been properly developed (Zichermann, 2011).

Additionally, in a recent 2012 survey conducted by the Pew Internet & American Life Project on the future of gamification, experts surveyed brought to the forefront the insidious nature of gamification when it is employed as a means to pit individuals against one another, and suggested that individuals will learn how to game the system in order to get the external rewards for their effort. Other experts pointed out that often, in gamified systems, individuals who are playing the game do not realize that information on their psychological state of play is being collected as back end data that can later be used to manipulate them through marketing schemes and other arenas that serve to benefit the industry over the consumer.
Promises

However, that is not to say that gamification cannot also hold promises. Games are fun and gamification, when employed judiciously and with the elements of good gaming can also be fun. As Koster (2004) points out, fun is and should be another word for learning. Good learning situations and environments are hard, but also fun and rewarding.

McGonigal (2011) sees the promise of gamified engagement in what she calls Alternate Reality Games (ARGs). McGonigal sees these experiences as having the ability to connect the world and solve some of the world's most complex problems. Indeed, gamification, when used properly can do this. An ARG uses an interactive narrative in a real world setting and delivers it in such a manner to improve the life of the individuals who play the game and it inspires them to continue with the changes that they have made long after the game has ended. An ARG always has real world implications and can change people's lives for the better. In her second TED Talk, McGonigal described an ARG that she designed at a point in her life when she was suffering from recovery from a head trauma. The ARG that she created was called SuperBetter. In this ARG, Jane McGonigal created a game that allows individuals who had been diagnosed with severe and debilitating injuries, diseases, or health issues a game that allowed them to remain curious, optimistic, and motivated even in the most dire of circumstances.

One of the most important concepts and promises that can be seen in using gamification is the power to engage and motivate people, and the power that gamified experiences have in tapping into collective intelligence. When social innovations occur because of the reliance on cooperative and collaborative efforts, like Foldit we see one of the most powerful possibilities for this type of learning experience. Foldit was a crowdsourced game experience that drew over 46,000 players who within ten days solved the mystery of how a key protein may help cure HIV-- a mystery that had thwarted top researchers and scientists. No matter how that is looked at, that is a powerful message for the promise of gamification.

Future in Education

As to the future of gamification in education educators need to be wary of using the most basic of game mechanics (the points and the leaderboards) and examine what makes truly successful game experiences so very successful. They must examine that which they want to gamify, and realize that videogames, and games in general, are in the simplest form an immersive experience, and that experiences are different for every person who encounters them. Games need to be better understood, and in line with what Zichermann (2011) has posited, in the future, if gamification is to be successful, both industry and education will need to hire individuals who are oversee the production of these experiences to ensure that the experiences that they are trying to promote are the actual best experiences for students based on sound theory and research in human psychology, both in social awareness, cognition, and learning theories.

Gamification is not easy and should not be used as a bandage to fix an already broken system or cover up and make a problematic program attractive to users. Education is messy, and games are messy. As such, in order to tap into the most powerful way of using gamification in learning situations, like schools, we need to return to the works of play theorists Johan Huizinga (1950), Richard Caillois (2001), and
Brian Sutton-Smith (2001). There needs to be a deeper examination of Gee’s (2007) 36 Learning Principles inherent in videogames. This examination will allow educators to discover that gamifying education must take a different track than gamifying industry. These differences will emerge as educators become more cognizant of their own learning when they are also invested in game play. One cannot create a gamified experience without first having experienced a game. As such, in order to gamifying education and learning experiences, educators, curriculum developers, and policy makers involved in educational decisions should invest a healthy amount of time in playing games.

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About the Author

Hannah Gerber is an Assistant Professor in the Department of Language, Literacy, and Special Populations at Sam Houston State University. She is interested in the impact that various media and technologies have on culture, broadly focused on the impact on learning and socialization across cultures and societies through transnational flows and responses. Her immediate focus is on the impact these digital spaces have on learners within public school systems, with an interest in both urban and rural schools systems. Her research has focused on the examination of ecologies and pedagogies afforded through videogaming practices among adolescents, considering both the affordances and constraints that the medium of the videogame, and the related practices, the metagame, have on students’ independent and often unsanctioned literacy practices.