Re-examining “Engagement” in Discussions about Gamification

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The dawn of the computer age ushered in a paradigm shift from the industrial era to the digital era with ramifications for technology and education that continue to evolve. As the computer industry became the primary focus of technological innovation, programmers working long hours writing and compiling code alleviated the technical difficulty and tedium of their tasks by writing games on computer systems intended for infrastructural support in business and government. While technologists heralded the dawn of the digital era, programmers quietly but steadily built games during breaks and lunch hours that set off a chain reaction, affecting ways in which we communicate, socially interact, and educate.

Games have a privileged position in our current computer technology and the expansion of the population which casually games is indicative of expanding interest in games throughout our society. Generations who consume digital content as a part of their everyday activities demand greater interactivity from the entirety of their experiences, and academics, in turn, are beginning to address the demand through the gamification of the classroom. Educators conducting classroom experimentation and research attempt to capture primary indicators of success under the term *engagement*, which is and will remain problematic for researchers until engagement is properly defined. What follows is an account of how researchers have come to identify engagement as a key element in gamification of education and the problematic nature of undefined engagement.

The Social Trend of Casual Gaming

Many people think of gamers as “little kids and guys who are probably single, probably unemployed, and eat pizza onto their shirts,” but statistics show that “the average gamer is 35

years old" (Chou, 2014). Including all people who play games for greater than three hours per week, the US gamer population is currently 42% of the total US population, with significant portions of the gamer population represented as 78% over 18 years old, 51.9% female, and an average age of 37 years old (Entertainment Software Association, 2015).

If we include demographics from the European Union (and the United Kingdom), gamers comprise "126 million [people under 35 years old…and] the way that [they are different from the] generations that we may belong to, is that video games are the primary form of entertainment that [they are] consuming. Gaming is already starting to have a tremendous effect on society. All around us, [the] desire for game-like experiences is reshaping industries" (Zichermann, 2011). In particular, gamification has spread to the wearable fitness tracker industry with watches that display encouragement, competition rankings, and badges for accomplishments (Janaki Kumar [TEDx], 2015); to the dental hygiene industry with smart toothbrushes that award coupons to frequent users (http://www.cnn.com/2010/TECH/04/05/games.schell/index.html); and to law enforcement and insurance industries with radar- and camera-connected systems that generate lottery ticket rewards for speed-conscious drivers funded by tickets given to speeders (Chou, 2014).

The spread of game design elements is not accidental. Before elements found in video games appeared in non-game settings, video games included content from a diverse range of educational subjects in some surprising ways. From mid-1980's games to current games, some game creators have found ways to invest the expected entertainment of a video game with educational experiences including in areas such as geography, math, critical thinking, problem solving, artistic appreciation, and history. When the video game industry recounts major events

in its own development, according to Zichermann, “most people think that Atari 2600 is really sort of the nexus, the catalyst of the video game business. But I actually think that ‘Where in the World is Carmen Sandiego’ [1985 video game] is probably the most important video game ever made, principally because it was the first and the last time that parents, teachers, and kids all agreed that a video game was awesome” (Zichermann, 2011). “Where in the World is Carmen Sandiego” situates itself as a fusion of entertainment and education in geography and problem solving by presenting gamers with the rhetorical situation of a detective game in which education is a byproduct. More recent examples include the Dynasty Warriors (1997 to present) and Samurai Warriors (2004 to present) video game series, which both contain an incredible amount of information about feudal periods in China and Japan (respectively). These games don’t merely include statistical information, they require gamers to actively learn about historical warriors and strategists, place-names, pivotal battles and treaties, inventions, and era literature and poetry, all against the backdrop of a third-person RPG hack-and-slash fighting game. With some games already providing educational value and an expanding base of gamers that expect greater interactivity with and more immediate and satisfying feedback from both digital and social settings, gamification as a major movement in education is inevitable.

The Gamification of Education

Gamification and Game Designed Learning (GDL) first appeared in scholarly education articles around 2008 (Dicheva, 2015). Gamification and GDL are generally defined as *the use of game mechanics, elements, and design, in non-gaming environments and settings* (Alcivar, 2016; Chang, 2016; Dicheva, 2015; Fisher, 2014; Kuo, 2016; Landers, 2017; Mekler, 2017; Seixas, 2016; Chou, 2014; TEDx, 2015; Zichermann, 2011). In addition to using a standard

definition for gamification, the field is also in general agreement that, if used effectively, gamification provides entertainment and enjoyment (Chang, 2016; TEDx, 2015) through enhanced “participation … excitement and creativity” (Fisher, 2014). Proponents posit that gamification results in “entertainment that causes learners to enjoy actively participating and engaging with others, such as through reputation points, rewards, and goal setting” (Chang, 2016) using “compelling, appealing, social activities that gamers problem solve to advance and gain points, badges, trophies, etc.” (Fisher, 2014) or “points, badges, and leaderboards” (Chou, 2014). In practice, gamification often looks like a badge collection game when desirable student behaviors and learning outcomes result in rewards such as digital badges on a student-wide social-education web page (Seixas, 2016). Gamification can also be implemented by using analog and digital games for practical application in conjunction with traditional lectures that cover theoretical principles (Vieyra, 2015), such as the use of the Lightbot game (lightbot.com) in conjunction with procedural programming lectures.

While research primarily focuses on academic settings, researchers point out that gamification techniques are as applicable when attempting to “enhance [students] programming skills” (Mathrani, 2016) as they are “in many nongame contexts, with applications in the commercial market and education” (Kuo, 2016). In particular, several researchers have adapted classroom gamification to meet the needs of corporate enterprise software training and tutorials (Alcivar, 2016; Landers, 2017). While lauding the potentials of gamification, researchers remain mindful of its limitations, pointing out that “gamification is not about incorporating game elements with no specific purpose and expect[ing] it to improve user engagement and motivation, the system needs to be aligned to the organization's objectives”

(Alcivar, 2016). Some researchers further point out that gamification is itself not new, simply the current academic conversation's trending term, and that, though continuing research and discussion is important, we should also acknowledge gamification's heritage, explaining that "badges and ranks have been long used in the military[:] in the early Soviet era, game elements were used by the Soviet Union leaders as a substitute for monetary incentives for performing at work, etc." (Dicheva, 2015).

Engagement as Core to the Success of Gamification

Researchers use student/user engagement as one of the core measures for the success of gamification in education. In a review of the literature, all researchers used the term engagement, but not one defined the term. Furthermore, only one attempted to capture quantifiable data, though that data is suspect as the researchers asked their study group to gauge the change in engagement without supplying a working definition to the study group (Chang, 2016). Statements highlighting the importance of engagement to gamification included the following.

- "[G]amified systems increase user engagement and performance" (Alcivar, 2016)
- "[E]ducation is an area with high potential for applying gamification because it substantially promotes learner motivation and engagement with the learning platform" (Chang, 2016)
- "[Gameful approaches] afford long-term intrinsically motivating and sustained engagement" (De-Marcos, 2016)
- "[P]apers report encouraging results from the experiments, including significantly higher engagement of students in forums, projects, and other learning activities" (Dicheva, 2015)
- "[G]amification helps this process because it is engaging and gives rewards to those that play and accomplish goals and objectives" (Fisher, 2014)
- "[G]amification [combines] content area instruction, literacy, and 21st-century learning skills in a highly engaging learning environment" (Kingsley, 2015)

- "[F]rom a gamification point of view, the purpose is to increase user engagement and motivation and thus keep visitors, and thus the results matched our expectations" (Kuo, 2016)
- "[G]amification purveyors believe that the use of gamification will make their instruction feel more engaging" (Landers, 2017)
- "[T]he GBL experiment showed us that students could be actively engaged in applying programming principles with defined gaming steps" (Mathrani, 2016)
- "[O]ur findings are still relevant for non-game contexts in which long-term user engagement and retention may not necessarily be the primary goal, such as increasing participation and performance in crowdsourcing tasks" (Mekler, 2017)
- "[G]etting closer to the idea of gamification and games, other studies conclude there is a strong relation between fun and engagement" (Seixas, 2016)
- "[S]tudents engaged in authentic scientific discourse as they collaborated to solve challenges—behavior I do not often observe, especially among my English language learners" (Vieyra, 2015).

All researchers note the importance of engagement in their work, but leave readers to infer what is meant by engagement within the context of each study and a field-wide inference is impossible as no two researchers describe observing a shared set of behaviors.

Engagement as a Problematic Term

Without a shared definition, the effectiveness of gamification in increasing engagement cannot be confirmed, and further research cannot add to the extant discussion. As it currently exists, engagement functions as both a god-term and as a confused notion. Kenneth Burke spoke of god-terms as "implicit in the logic of language, which naturally makes for culmination in some word of maximum generalization that serves as over-all title of titles (and this is what we mean technically by a 'god-term')" (Burke, p. 224). A god-term can be thought of as positively-charged cluster of ideas held within a single symbol. For many Americans, the terms America, freedom, and patriotism all function as god-terms in that all of the component associated terms remain free from negative associations. God-terms are usually detectable as terms with semantic power (when used, the term's first letter is a mentally-added capital

letter), but they are difficult to use without intentionally or unintentionally praising the subject. In gamification, researchers use engagement as a god-term. The term is relatively free of negative associations and often describes unmeasurable aspects such as enjoyment, focus, excitement, and so on. Within the field of education, engagement is synonymous with quality educational experiences, but it remains unexamined: the hallmark of a god-term.

Confused notions are similar to god-terms in some ways, as both are terms which require "unpacking," but confused notions are different in that they do not carry the "positive charge" that mark god-terms. Confused notions may also include measurable attributes. Perelman described encountering an example of confused notions in a lesson Socrates delivered to his students where disagreements about measurable quantities were resolvable by consulting standard measurement techniques while disagreements about qualities such as "right and wrong, the beautiful or the ugly, the good and the bad" required dialectic resolution (Perelman, 1979). In the coordination of measurable and quality-driven descriptions, a confused notion is at work and acting as a container for both measurable and immeasurable aspects. When engagement is used in the literature, it has both measurable aspects (e.g., changes in class attendance, GPA, number of disruptions during lectures, etc.) and immeasurable aspects (e.g., student enjoyment, participation levels, emotional atmosphere, etc.). While immeasurable aspects are not quantifiable, they are qualifiable. To effectively measure or assess a confused notion such as engagement, you need to gather both qualifiable and quantifiable data in order "underscore the confused and uncertain character of all those opinions and ideas which cannot be quantified" (Perelman, 1979). Researchers must address the bias and complexity inherent in god-terms, confused notions, and difficult definitions so as

to avoid making erroneous assumptions. Knowingly including such terms without questioning the term “would be to act in a manner similar to the counterfeiter, abusing the confidence that one accords to legal money” (Perelman, 1979).

Engagement as a Performance Metric

The literature on gamification presents several examples where researchers attempt to label engagement as a key characteristic of successfully implementing gamification in instruction. After achieving some success in their implementations, researchers surmise that engagement must have been improved, but they offer insufficient evidence, often relying on personal anecdotes. Developing research areas commonly make this mistake. Instead, such research needs to begin with the question, what makes for a good metric? The unfortunate response from some researchers is “‘any metric that will make my method look good.’ And if no known metric will suffice, then simply make a one up” (Nicholls, 2008). According to Nicolls, “this is a typical indicator of an under-regulated and under-developed field” (2008).

Researchers attempt to use engagement as a performance metric but do not apply the necessary level of specificity when using it. In “The Best Ways to Define and Implement Performance Metrics” (2008), Suzette Olson defines performance metrics for a non-technical audience thusly: “Performance is simply the execution of work; metrics are merely mechanisms to measure progress. Taken together, performance metrics are measures of work performance.” The literature overwhelmingly agrees that the use of gamification does increase engagement, but researchers have yet to describe a comparative system for measuring success. In establishing the specific traits of a successful implementation, the literature can move from a

binary description of performance to a graduated description of performance. Olson also offers encouragement to developing fields, stating that “the best time to use performance metrics is when it is the most difficult to define those metrics” (Olson, 2008). By their nature, performance metrics tend to be used for quantifiable rather than qualitative data. But qualitative aspects of engagement can be measured with the use of an effective metric as methods exist to “develop the most appropriate metrics and mechanisms to evaluate research effects, both those that are quantifiable and, arguably more important, those that are not” (Rekhi, 2012).

Conclusions

The literature is in agreement that gamification is a social trend that is only going to increase, and that, consequently, students are coming to require gamification of content for that content to remain or increase its effectiveness in education and training. Extant research’s use of engagement as a desired student outcome and as a primary indicator for success is problematic. To resolve terminological issues, future research must clearly define what is meant by engagement and must openly describe both measurable and immeasurable aspects of engagement within the context of the study. If engagement is to be used in developing suitable performance metrics for gamification, then it must label components of success and measurable indicators for comparative analysis. Until researchers resolve these issues, the academic dialog cannot reach definitive conclusions about the effectiveness of gamification as an educational pedagogy.

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