

Gamification in Education

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ABSTRACT

At heart, gamification is a powerful tool for catalyzing attention, focus and investment. What parent ever resisted gamifying the process of getting a group of kids to the car by announcing that it was a race? Gamification transfers the mode, value and incentive of game play to a separate experience like buying groceries, visiting web sites, or even learning. By borrowing the intrinsically rewarding elements of game play; rules, victory conditions, rewards, punishments, status, stakes and personally vested narrative other endeavors can find fresh appeal with stakeholders and increase the likelihood adoption. As the core concept of marketing is the association of two appealing, but dissimilar ideas; motorcycles and prestige, cereal and athleticism – so too, gamification can be applied to associate fun with learning. In essence, the student is hooked by the idea of the game, pulled forward by curiosity to learn more or win, and ends up enjoying the experience, becoming engaged in the idea or activity and opening themselves up to the possibility of learning.

INTRODUCTION

Games create engagement – a necessity for any learning experience (Gogos, 2012) Gamification is the process of adapting an experience like purchasing bread, mastering a handwriting recognition program or learning math with game-like elements.

A 2012 survey conducted by the Entertainment Software Association showed that the age demographic of game players in the U.S. is split in almost equal thirds with people ages 18-35 representing 31% of gamers. (New Horizon Report, 2013). Popular culture has adopted the metaphor of games as a mode of simulating experience and practicing skill acquisition.

Digital gaming is now pursued by a majority of the first world population. The age range of gamers gets younger every year while veteran gamers continue to play well beyond childhood. As tablets and smartphones have proliferated, desktop and laptop computers, television sets, and game consoles are no longer the only way to connect with competitor's online, making game-play a portable activity that can happen in a diverse array of settings. Game play has traversed the realm of recreation and has infiltrated the worlds of commerce, productivity, and education, proving to be a useful training and motivation tool. While a growing number of educational institutions and programs are experimenting with game-play, there has also been increased attention surrounding gamification — the integration of game elements, mechanics, and frameworks into non-game situations and scenarios. (New Horizon Report, 2013) The question remains, how and to what degree gamification can be used as one tool among many to catalyze learning engagement while improving knowledge retention and skill acquisition among disenfranchised learners.

Businesses have largely embraced gamification to design work incentive programs and mobile apps that engage employees through rewards, leader boards, and badges. Although still in its nascent stages, the gamification of education is gaining further support among researchers and

educators who recognize that games stimulate productivity and creative inquiry among learners. (New Horizon Report, 2013). The primary value provided by gamification is heightened, voluntary and enjoyable engagement. This engagement not only attracts new customers, but can result in both *habit* and *culture* which encourage repeat use and return customers. Once drawn into the fun of the game, the amount of time spent around the brand increases as does the opportunity for purchase and emerging brand loyalty.

Advancements in mobile technology further expand opportunities for game-play, allowing participants to engage any time from any place. Anyone who owns a smartphone or tablet can become a gamer. Free mobile games abound, and the most popular have become widely used outlets for social interaction and connecting family and friends, such as “Words with Friends” — a modern take on Scrabble. Social networking features of mobile games support the prevalence of game play in a culture that is increasingly concerned with staying in touch and being connected all of the time; in this sense, the appeal of online games is not just about who is playing, but who in one’s personal network is playing. (New Horizon Report, 2013). This ubiquitous existence of available gaming screens opens up new time frames for engagement. Where once learning happened during “school hours” and advertising was consumed in the morning paper or evening television – now messages can be received and content delivered at virtually all hours, locations and walks of life.

When the concept of gamification is applied to education, the opportunities for experiential, self-paced and lifelong learning expand exponentially. Learners are hooked by fun and then rewarded with knowledge and skills.

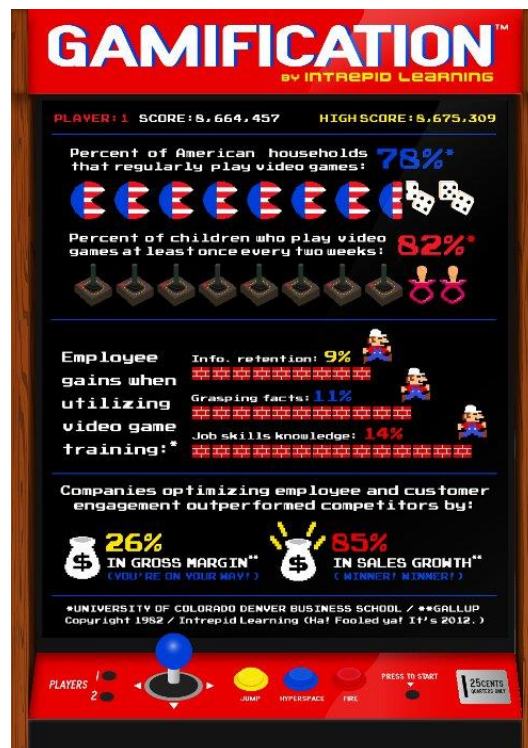


Figure 1: Gamification Impact (Gogos, 2012)

CONTEMPORARY GAMIFICATION

According to the Utendorf August 13, 2013 article on IntrepidLearning.com, Gamification is the process of using gaming methods and mechanics in a non-gaming environment to motivate customers and employees. According to Gabe Zicherman in his textbook Gamification by Design Gamification is “the process of game-thinking and game mechanics to engage users and solve problems” It’s not about developing full-on games, but rather it’s about using gaming attributes to drive engagement, strengthen skills, or behavior changes. (Utendorf, 2013) Learning is not made into a game; the features of games (curiosity, collecting, exploration, and domination to name a few) which entice players to engage are used to draw in learners.

Consumer-facing businesses use gamification to drive revenue and consumer engagement through loyalty cards, referral discounts, and social media. Gamification is also rapidly becoming an important strategy for all kinds of organizations to drive employee engagement and loyalty. Human resources and L&D teams, in particular, can leverage gamification in a variety of ways, including:

- Increasing participation in employee satisfaction surveys
- Motivating users to complete mandatory and optional training
- Inspiring workers to join in corporate wellness programs
- Encouraging positive adoption of change management projects

There is excitement about applying these heightened engagements among employees, customers, patients and management students in education; reluctant or compulsory students in particular. Any tool which can catalyze curiosity from an inert learner will increase potential skill and concept acquisition. (Utendorf, 2013)

GAMIFICATION IN MARKETING

By 2015, more than 50 percent of organizations that manage innovation processes will gamify those processes, according to Gartner, Inc. By 2014, a gamified service for consumer goods marketing and customer retention will become as important as Facebook, eBay or Amazon, and more than 70 percent of Global 2000 organizations will have at least one gamified application. (Goasduff, Laurence, Christy Pettey, and Brian Burke, 2011) This not only opens up the potential for consumer level game development tools, but normalizes the method and mode of game based learning engagement. By normalizing games they begin to lose the taboo of the early 1980s which is that they are for introverts and malcontents.

"Gamification describes the broad trend of employing game mechanics to non-game environments such as innovation, marketing, training, employee performance, health and social change," said Brian Burke, an analyst at Gartner. "Enterprise architects, CIOs and IT planners must be aware of, and lead, the business trend of gamification, educate their business counterparts and collaborate in the evaluation of opportunities within the organization." (Goasduff, Laurence, Christy Pettey, and Brian Burke, 2011). Business tends to mirror the practices of politics and modern education takes their cue from business as more and more educational institutions wake up to the reality of their fiscal responsibility as an institution.

Criticism has been levied at the slipshod application of Gamification by some consultants, and poorly thought out marketing campaigns. According to game theory experts, authentic gamification requires careful marketing crafting and execution with respect to the genuine characteristics of true games. The simple addition of point systems and badges to an experience does not make it game or take the place of meaningful interactions, sincere challenges and

incentive to exceed ones comfort zone. This sentiment was hotly expressed at the Wharton conference, Georgia Institute of Technology professor and game designer Ian Bogost called gamification efforts "exploitation-ware" that is being "invented by consultants as a means to capture the wild, coveted beast that is video games and to domesticate it for use in the grey, hopeless wasteland of big business." Gamification, he argued, "gets games wrong, mistaking incidental properties like points and levels for primary features like interactions with behavioral complexity." In the GDC 2011 gamification debate, he states that "To take something like games, which are complicated, and substitute it out for points and badges is a very efficient way to get a hot culture commodity into your product". (XU, 2011)

IMPACT ON EDUCATION

The most logical starting point for the gamification of education is in the context of online course delivery. The technology, interface, expectations and familiar metaphors are all in place for an optimally smooth transition from text farming to gamified engagement. The New Media Consortium's 2013 Horizon report shares the following: In the context of higher education, when students are expected to think critically in order to solve problems, game-like simulations can be leveraged in any discipline to reinforce the real world applications of concepts. At the IE Business School in Madrid, for example, students are learning the complexities of global economic policy through a game called "10 Downing Street" (go.nmc.org/street). In this simulation, students take on the role of the British prime minister and work with key figures including Paul Krugman, Margaret Thatcher, and Milton Friedman to come to an agreement that will affect the wellbeing of the national economy. In teams of six, students engage in debates to determine the most viable policy option, which is then put into practice after a general election. Scenarios like this one demonstrate the power of games to mimic pressing issues, requiring students to do higher-level thinking and exercise skills pertinent to their area of study. (NMC, 2013)

Hybrid classrooms and purely brick and mortar educational delivery models can both leverage the concept of gamification to enhance engagement and improve content comprehension. While contemporary views of gaming are focused on digital video games, the [non-digital] game of Mancala was spread in part through the movements of the soldiers of the Roman Empire. Many Roman period Mancala boards are graffiti type boards, that is to say the rows of cup indentations were carved into the steps of the theatre at Palmyra; others are found in house floors and temple walls as documented in a recent survey. Others have been found in Ephesos and northern Egypt; largely adhering to the boundaries of the Roman Empire. (Hirst, 2013) Enterprising legionnaires could have leveraged the stone and pit based game into a training exercise had that idea been more in keeping with the zeitgeist.



Figure 2: Modern Mancala board



Figure 3: Original Pit & Stone Mancala

At the most basic level, there is particular skill content which lends themselves to specific types of games. As with the application of gamification itself, care must be used when borrowing an idea from one field and adapting it to another. Early learning games simply showed the student

digital flashcards, failing to adapt the experience to the new medium and completely missing the opportunity to gamify the experience itself. Below is a table of game to content relationships intended for K-12 students, but applicable to any learner at the beginning of their course of study.

Listed in the following table are which games are appropriate for certain types of content:

Instructional focus	Best game types
Teaching facts (declarative knowledge games, i.e. the only way to learn it is through memorization)	matching games, multiple choice, organization – drag/drop
Conceptual knowledge games	examples, non-examples, results of conceptual understanding
Procedural/ rules-based knowledge	board games in which you predict and apply rules, observe consequences of rules
Problem solving knowledge games	Branching simulation, using a virtual world (where a person is behind an avatar which means infinite branching)

[Figure 4](#): Learning to game type chart (Gogos, 2013)

POTENTIAL APPLICATIONS

As hotly postulated by Ian Bogost and echoed by Bartle in the succeeding paragraphs, the application of gamification must be done with a deep understanding of game mechanics and a clear grasp of gamer motivation. According to Bartle there are four basic categories of gamer, arranged here to for the acronym SAKE for easy recall.

Socializers are often more interested in having relations with the other players than playing the game itself. They help to spread knowledge and a human feel, and are often involved in the community aspect of the game (by means of [managing guilds](#) or [role-playing](#), for instance). **Achievers** are competitive and enjoy beating difficult challenges whether they are set by the game or by themselves. The more challenging the goal, the most rewarded they tend to feel. **Killers** like to provoke and cause drama and/or impose them over other players in the scope provided by the virtual world. Trolls, hackers, cheaters, and attention farmers belong in this category, along with the most ferocious and skillful PvP ([player versus player](#)) opponents. **Explorers** like to explore the world – not just its geography but also the finer details of the game mechanics. These players may end up knowing how the game works and behave better than the game creators themselves. They know all the mechanics, short-cuts, tricks, and glitches that there are to know in the game and thrive on discovering more. (Bartle, 2013)

Similar to Bogost, Bartle calls it [Gamification] a bandwagon. A designer reads the summary; “four types of player? Okay, let’s roll with that.” They don’t know why or how, but still they try to slap the theory on a non-MUD (or even non-game) activity. This is how you end up with, for example, a shoe selling website that grants you points each time you buy a pair of shoes. With a certain amount of points, you get the access to a specific pair of shoes you can only buy thanks to the points you collected. So far it sounds good – it’s viable and works for achievers. Nevertheless, consider an explorer who is visiting *every* part of the website. Imagine he gets points for it. These points are worthless to them – rather, you should reward them with a way to keep on exploring the site; they’ll thank you by continuing to play (i.e. interact) and enjoy the site. In the same way, a leaderboard won’t necessary sit well with a socializer. He’s not interested in rankings, he’s more interested in meeting and getting to chat with and know more people. (Bartle, 2013). Like Bogost, Bartle cry of dismay is not against gamification, but a plea to take it farther; to its logical and complete application.

Another feature of games universities are experimenting with is badging, a system of recognition that allows students to accumulate documentation of their skills, achievements, qualities, and interests in a visual public- facing format. Launched in September 2011, Mozilla Foundation’s Open Badges project (go.nmc.org/badges) is a free online platform for designing and collecting badges in portfolios that can be viewed by peers, professors, and potential employers. Mozilla’s Open Badges has sparked considerable discussion about how to recognize informal learning experiences, especially those that cannot typically be conveyed through credit hours or grade point average. (NMC, 2013) Badging appeals most strongly to the combination of Achiever and Socializer Bartle type; the achiever has earned a visible rank of distinction which they personally value whereas the socializer now has a visual symbol they can show off to their peers and even use as a jumping off point for further socialization, discussion the badges acquisition or joining a group of similarly ranked players.

FEEDBACK

The instantaneous nature of student / player feedback is one of the most compelling arguments for the gamification of education. Life often offers people erratic, inconsistent and unreliable feedback on their actions. In an educational setting that feedback often becomes more focused, but not necessarily faster. An on ground student may have to wait a week or more to get feedback on an assignment, presentation or even a thought. An online student usually waits 24 to 48 hours. In a game setting feedback is almost always immediate, targeted and designed to enable to player to alter their approach for better, more desirable results.

In essence a videogame is affective if it can maintain an affective feedback loop; if the player becomes consciously aware of how that feedback loop is controlled by their physiology and so able to consciously control their reactions, the affective nature of the feedback loop is lost and it becomes a form of biofeedback. The creation of affective games is therefore dependent on how the game designer uses the physiological responses of the player in influencing gameplay. (Gilleade, 2005)

CONCLUSION

While the term Gamification has fallen under some scrutiny in recent media, the concepts, ideas and applications behind it appear to be gaining traction. As educators continue to explore better and more effective ways to engage a wider audience of learners in a broader context of environments, the adoption of gamification methods will continue to offer quicker and more effective catalyzing tools than traditional sage on stage instruction.

As consumers and businesses embrace the Internet, strategies of e-commerce applications and processes need to be constantly reassessed. Many Internet retailers overlooked the importance of supply

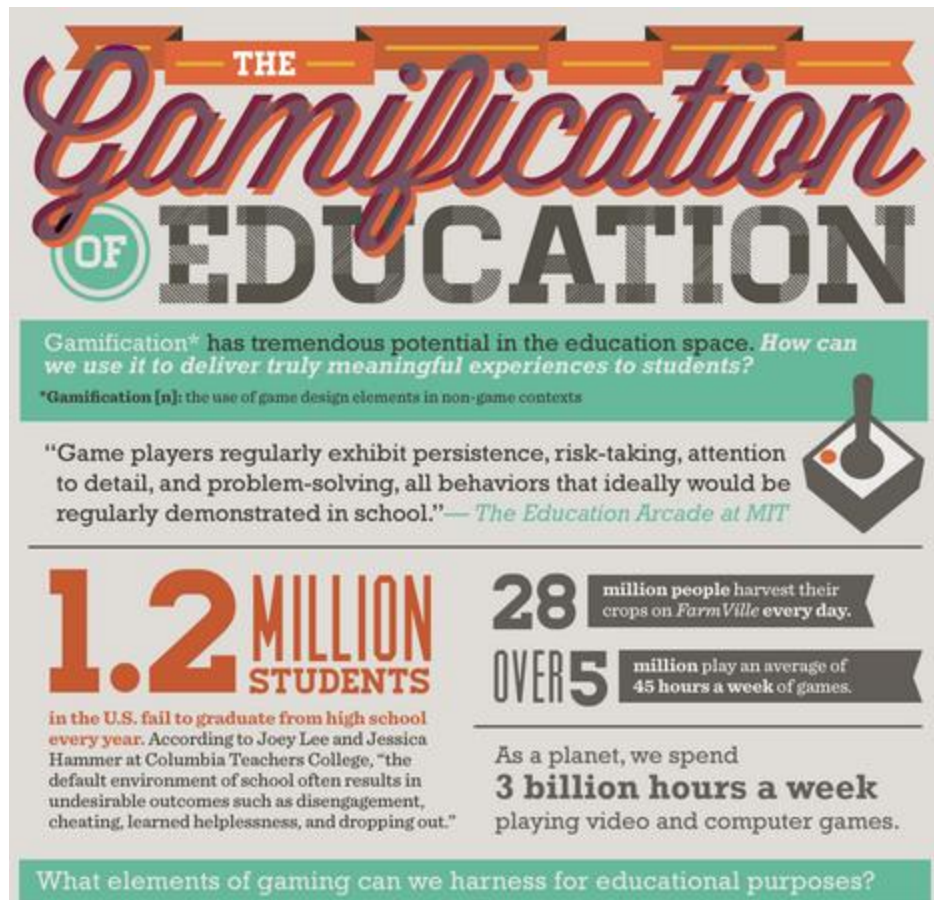


Figure 5: Infographic of game based engagement (Education Arcade, 2013)

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BIOGRAPHY

Brian Arnold holds an MFA from USC School of Cinema and Television and serves as Lead Faculty for the BA in Digital Media Design at the School of Engineering, Technology and Media, National University.