

Gamification in Education

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## GAMIFICATION IN EDUCATION

**Abstract**

The students in today's classrooms are different learners than those in classrooms fifty years ago. In an effort to reach students on their level, educators nationwide are taking professional development courses in the so-called "21<sup>st</sup> Century Learning." Major changes to the education system have been made, using Web 2.0 tools such as Edmodo, Moodle, Voki, Glogster, Animoto, Blogs, and Wikis among countless others. Some groundbreaking educators have engaged their students in Game-Based Learning (also called GBL by some), though the concept has been around for quite some time. Games also exist in more forms and genres, and on more platforms, than at any other time in history.

Educators know that *something* is wrong, *something* is not working, because they are not able to reach children the same way they used to. Today's educators must choose to either carry on with the way they are teaching now, accepting that they are not adequately reaching students, or change their teaching style to a way that is more natural to how the digital natives are learning.

Using what has been learned about education over the last century, this paper seeks to explore the Gamification of education, look at the resistance to gamifying education, show the good effects of gaming, and to make a case for turning the current dysfunctional educational model in to a functioning and effective Game-Based Learning model.

Keywords: *Gamification, 21<sup>st</sup> Century Learning, Game-Based Learning, Gamification*

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### Who Are Today's Students?

“Millennials”, also known by many other names such as “Generation Next,” the “Net Generation,” “Echo Boomers,” and “Generation Y”, are persons that were born from the late 1970's into the early 2000's (“Generation Y,” 2012). While this can include many of today's Middle-through-High School students, many of the younger students belong to “Generation Z.” Generation Z, including persons born from 1995 – 2009, is also called the “Connected Generation” because of their constant internet connectivity, or even “Generation Lay-Z,” (Micoleta, 2012) due to their short attention spans and general lack of engagement in society. No matter what one names the generation,

“Today's students – K through college – represent the first generations to grow up with this new technology. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. Today's average college grads have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV). Computer games, email, the Internet, cell phones and instant messaging are integral parts of their lives.” (Prensky 2001, p.1)

The students that the education system was designed to teach have changed. Because of the digital era that they are being raised in, the students cannot sit still for an hour-long lecture, they choose to skip steps instead of following logic or step-by-step instructions, and naturally choose instant gratification over painstaking learning. The world of education that educators are pushing to these “digital natives” holds no appeal. Simply put, for today's students, school moves too slowly for them, and they choose not to pay attention (Prensky, 2001). Furthermore,

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the children stimulated by digital technology, especially playing video games, ultimately might “...find the realities of the world underwhelming, understimulating,” says Dr. Dimitri Christakis, a pediatrician (Klass, 2011).

### Gamification

“**Gamification**; Noun; - gam(e) + ;ification. Verb- **gamify**; gerund: **gamifying**. Gamification is the use of game design techniques and game mechanics to solve problems and engage audiences. The earliest traces of the usage of the word go back to March 2004, but it did not become popularly used until later in 2010.” (“Gamification,” 2012)

Advertisers, marketing firms, and companies in general are beginning to look towards games, and the mindset that comes with them, as the way to reach today’s consumers, including children and adolescents. Gamification is being talked about as the next big thing in marketing. In his 2011 TED (Technology, Education, and Design) Talk, Gabe Zichermann, author of the book “Game Based Marketing,” quotes Brian Burke of the Gartner Group, saying “50% of all innovation, and 70% of Global 2000’s (businesses) apps will be gamified by 2015.”

(Zichermann, 2011) Why is gamification so pervasive? Why does it make such a difference? Why are companies pushing money into the gamification of their products or advertisements? The reason is simple; people see games as fun, and they are willing to overlook some not-so-subtle advertising to play a game that they deem worthy, mainly based on the opinions of their friends. Social media has played a very large role in gamification. In fact, many of the most popular examples of gamification rely on the social aspect for its popularity, for example: Farmville, Foursquare, Hold’EmPoker, Bejeweled Blitz, and many “Web 2.0” tools in education.

### Resistance to Gamifying Education

Educators know that *something* is wrong, *something* is not working, because they are not able to reach children the same way they used to, so educators are forced to make a choice, the

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proverbial fork-in-the-road. Today's educators must choose to either carry on with the way they are teaching now, accepting that they are not adequately reaching students, or change their teaching style to a way that is more natural to how the digital natives are learning.

The failure is not solely the fault of educators. It is fair to say that almost everyone is biased against games. This bias is part of our language and culture, and the word "game" with its variants, is constantly and consistently used in a negative fashion. As a culture, we see a suspicion surrounding games and their influence on our lives. For example, with the root word, "game," the reader understands that the subject at hand deals with playing, not work or anything serious. "Player" has an implication describing someone that manipulates others, or the rules, to get what they want. "Playing the game" similarly connotes that one should abandon their own ethics in order to get what they desire. These connotations have little to do with how games really are, but yet the nuances of the English language make it seem so (McGonigal, 2011).

Many teachers are particularly resistant to the thought of gaming coming to education. Teachers see video games as the aggressors against the students' desire to read, research, and pay attention. When teachers believe their students should be practicing social skills, physical activity, or even doing their homework, gaming, especially hardcore gaming, becomes viewed as a waste of time. They believe that because games are meant to be fun, that they are incompatible with learning, that learning cannot be fun, and that games cannot be considered to be hard work because it is, after all, play (Hirumi, Appelman, Rieber, & Van Eck, 2010). The perceived difficulty, mainly in the relinquishment of control, in the move from teacher-based instruction to learning-centered instruction is a large factor in teacher resistance to Game-Based Learning.

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### **Gamifying Education**

Because gamified education is a *learner-centered* type of education, students will be interested in learning. The students have ownership of their knowledge and progress, and the onus is on the student to actually learn what they are supposed to know. Game-Based learning boosts student engagement, erasing the instruction deficit that teachers are feeling pressured by now. The gamification of the education system, done in a multitude of ways, can do what students the world over want to see. In short, gamifying education can make school fun.

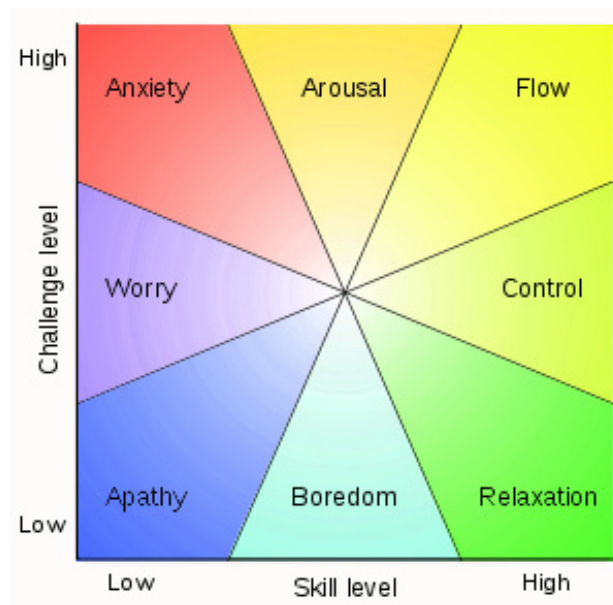
“...games enrich us with intrinsic rewards. They actively engage us in satisfying work that we have the chance to be successful at. They give us a highly structured way to spend time and build bonds with people we like. And if we play a game long enough, with a big enough network of players, we feel a part of something bigger than ourselves – part of an epic story, an important project, or a global community. Good games help us experience the four things we crave most – and they do it safely, cheaply, and reliably.”  
(McGonigal 2011, p.46)

Good games hit on all learning styles. Whether a learner is a Visual (pictures, images), Aural (sounds, music), Verbal (words, writing), Physical-Kinesthetic (body, touch), Logical (reasoning, logic), Social (working in groups), or Solitary (working by oneself) learner, games can meet your needs. As James Paul Gee states, “the theory of learning in good video games fits better with the modern, high-tech, global world today's children and teenagers live in than do the theories (and practices) of learning that they see in school” (Gee 2003, p.3).

One reason video games are so popular with people is that they deeply engage the player into the game. Games reward the player's brain with dopamine “rewards,” while keeping them

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challenged and interested in progressing. Games require the players to multitask. Gamers today chat in text and/or by voice, they operate characters with multifaceted remote controls, they must manage short term goals/objectives while keeping long term goals/objectives in mind, and all of this must be done while they manage interruptions from parents, phone calls, text messages, etc. (Zichermann, 2011). This type of engagement in an extensive and elaborate play environment, has been described by some as “flow”.



(Challenge vs. Skill)

Flow is “the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it” (Csíkszentmihályi, 1990). In his paper entitled “Why Games Work and the Science of Learning,” Curtiss Murphy gives a detailed comparison of Edward Thorndike’s “Laws of Learning” and critical techniques used by game designers, all viewed through the lens of Csíkszentmihályi’s Flow theory. The table below is the summary of this analysis: (Murphy, 2011, p.9)

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Law of Learning	Idea	Game Design Techniques
Motivation (Law of Readiness)	Motivated students learn more	<i>Flow</i> is the fundamental attraction of games. Games are <i>fun</i> and require moment-by-moment <i>choices</i> . This leads to extremely motivating experiences.
Feedback (Law of Exercise)	Feedback is how learners correlate actions with outcomes	<i>Feedback</i> is an essential part of games and a requirement for <i>flow</i> . The <i>simplicity</i> of games helps the learner correlate actions to outcomes.
Practice (Law of Exercise)	Practice is necessary for learning and mastery	Games use <i>practice</i> to promote mastery. They use increasing difficulty to keep players in <i>flow</i> and promote the learning of virtual or real skills needed to progress.
Positive Feelings (Law of Effect)	Learning is increased when associated with positive feelings	Games are supposed to be <i>fun</i> - defined as the positive feelings associated with compelling flow experiences. The <i>simplicity</i> and <i>involvement</i> of games encourages feelings of accomplishment and mastery.
Intensity (Law of Intensity)	Intense experiences increase learning, interest, and retention	A person in <i>flow</i> is intensely focused on an activity. The <i>feedback</i> loop intensifies the relationship between action and outcome. Games use a combination of <i>immersion</i> and <i>engagement</i> to create intense experiences.
Choice/Involvement (Laws of Intensity, Readiness, Effect)	Involvement and decision making can increase motivation, intensity, and positive feelings	Games <i>simplify</i> the world to a series of interesting and meaningful <i>decisions</i> . From moment to moment, players are actively engaged in the process of learning through experience.

Andrea Kuszewski, a Behavior Therapist and a Consultant for children on the autism spectrum, has come up with five principles that are involved in increasing ones fluid intelligence, the capacity to learn and retain new information. In his TED Talk, Gabe Zichermann pointed out that there is a parallel between these five principles and things that recur in all good/popular video games (Zichermann, 2011).

These five primary principles are:

1. Seek Novelty
2. Challenge Yourself
3. Think Creatively
4. Do Things the Hard Way
5. Network



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(Kuszewski, 2011)

Kuszewski says “if you *really* want to function at your absolute cognitive best, you should do all five, and as often as possible,” and continues, asking “If we have all of this supporting data, showing that these teaching methods... can have such a profound positive effect on cognitive growth, why aren’t more therapy programs or school systems adopting some of these techniques?” (Kuszewski, 2011). Educators *should* be harnessing the power that games have over our children. We should be showing them that this knowledge has its applications from video games and into real life.

There are many examples of educators harnessing games, and using them as fully functional educational tools. Ananth Pai is one such teacher that not just abandoned the traditional way of teaching, but *radically* abandoned it (Pai, 2011). Coming from a business background (process engineering), he went back to school to get a Masters of Education, and began teaching in an elementary classroom. Partially from his own money, and partially from grants, Pai purchased 7 laptops and 2 desktops, 11 Nintendo DS', 18 games for math, reading, vocabulary, geography, etc., & 21 digital voice recorders for our use for his classroom. In addition to the technology, he separated his kids by learning styles, overhauled the way his classroom was organized, and changed the instructional methods used. In his TED Talk, Gabe Zichermann cited Ananth Pai’s third grade class, as they described how they felt about learning in a Game-Based environment. The students said, “learning is fun” and “learning is multiplayer.” (Zichermann, 2011) And his student’s have even started a petition, asking for this type of technology and game-based learning to be law, and in every classroom in America. (Pai, 2011)

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### **Conclusion**

In conclusion, the time is upon us as educators and instructional designers to come to grips with the changing learners sitting in classrooms today. We need to put away our fears, stop fighting the trend towards gamification, and learn to “play” alongside our students. We need to design gamified learning experiences that will hook the learner into becoming a willing and persistent lifelong learner. Games can be an extremely useful tool in education if we choose to harness its power. The students are already mentally there, educators simply need to reach them, teach them, and motivate them using the technology that students are accustomed to and willing to learn from. “Play” no longer needs to be a word with bad connotations; it needs to be a part of our daily school curriculum.

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