Gamification of Learning

Defining gamification

The word gamification is relatively new and gained popularity only in the last five years or so. However, the idea of using motivating game elements in non-game contexts dates to the early 1980's. In the field of human-computer interaction, seminal works were written by Thomas Malone and others describing the benefits of game elements long before the use of the term *gamification*.

Deterding, Dixon, Khaled, and Nacke define gamification as, "the use of game design elements in non-game contexts" (2011, p. 1). Dominguez and coauthors echo this in their definition, which states, "Gamification is the use of game design elements and game mechanics in non-game contexts" (2013, p. 380). Lee and Hammer define gamification as, "the use of game mechanics, dynamics, and frameworks to promote desired behaviors" (2011, p. 1). These desired behaviors include learner motivation and engagement, behaviors that will then theoretically lead to increased learning. Karl Kapp explicitly describes these behaviors in his definition, explaining gamification as, "the process of using game elements, game mechanics, and game thinking to engage people, motivate action, promote learning, or solve problems" (2014). Gamification is not the same as using video games to educate. The core of gamification of learning is the *design* of instruction as opposed to merely incorporating technology or actual games. Gamification is extracting the motivational elements of games and implementing them in education. Often, gamification necessitates the use of technology, however the elements of gamification can be applied in a non-technology classroom or activity.

Common words and terms of gamification

Motivation and engagement

As Kapp's definition mentions, gamification is often used in education to try to improve student motivation and engagement. Proponents of gaming and gamification often relate the positive feelings achieved in gaming and game-like activities to happiness, feeling good, or the concept of flow. These emotional states, in turn, are then contributed to both engagement and motivation. McGonigal writes that the feel good emotions caused by gaming are resultant of the "activation of all neurological and physiological systems that underlie happiness" (2011, p. 28). The concept of

flow, introduced in 1975 by a psychologist named Mihaly Csikszentmihalyi, refers to a state of extreme engagement and optimism. Regarding the flow experience, Csikszentmihalyi lists eight universal “flow” characteristics:

(a) clear sense of what has to be done moment by moment; (b) immediate feedback as to how well one is doing: (c) an intense concentration of attention: (d) a balance between opportunities for action (challenges) and capacity to act (skills): (e) exclusion of irrelevant content from consciousness; (f) a sense of control over the activity: (g) a distortion of sense of time-usually hours pass by in minutes; and (h) a feeling that the activity is intrinsically rewarding, or worth doing for its own sake. (2000, p.381)

Csikszentmihalyi mentions that one way of increasing flow is to change “external conditions to resemble those of a game or a work of art: by clarifying goals, providing more detailed feedback, and creating a better balance between challenges and skills” (382).

Lee and Hammer identify three unique areas where gamification affects motivation and engagement: cognitive, emotional, and social (2011, p.3). On the cognitive level, games provide a structured set of rules and systems that players must navigate and attempt to conquer. Goals and mastery of systems and levels motivate players, and this is often called “leveling up”. Reward and recognition systems, such as badges, points, levels, leader boards, and achievements, activate emotional motivation. In the social area, either cooperation in teams or competing against others or a combination of both motivate players socially.

Well-designed games are careful to motivate players for success by creating low levels of anxiety and risk (Dominguez et al., 2013; Lee & Hammer, 2011; McGonigal, 2011) combined with frequent and immediate feedback. Lee & Hammer contrast this with the high-stakes nature and delayed feedback common in education, such as the bulk of a course grade being based on a final paper or project. With more limited risk, learners or gamers might fail at the task initially or even repeatedly, but the risk is low and the challenge is seen by the learner as something that can be accomplished with more work or repeated attempts. In this way, failure is a “stepping stone to success” (Barker, 2014, p. 80).

Some educators debate the motivational benefits of gamification and criticize the use of rewards systems for extrinsic motivation. Problems with the use of extrinsic motivation include lack of transfer with rewards-driven learning, learners feeling manipulated, and learner behavior ending when rewards end (Dominguez et al., 2013, p. 390). Proponents of gamification believe that intrinsic and extrinsic motivation can be combined, for example, by incorporating not only points and badges but also things like learner control and mastery of a topic or skill (Kapp, 2013, p. 342).

Elements of a game

What makes a game a game? What elements of a game are considered in gamification? The following are the main elements used in gamifying education:

- A challenge
- A goal
- Clear rules
- Immediate feedback
- Self-directed learning
- A story or alternate reality
- An element of choice

Sometimes, cooperation is an element of gamification, as some or all challenges can require learners to cooperate with others to achieve success. Competition between learners can also be present in gamified learning experiences. Finally, gamified experiences feature the rewards systems mentioned above.

Implementation ideas

How does an instructional designer or teacher add game elements without creating an entire game? By dissecting the elements of gaming that engage and motivate players, individual components can be identified for implementing in the onground or online classroom. Kapp makes a distinction between content and structural gamification. In content gamification, content elements are added, such as a challenge with clear rules, or a goal attached to a story. Creating a storyline that engages learners is a common game element that is often used as a foundation for the design of instruction. Malone referred to this in 1980 as “fantasy” and stressed its importance in creating instruction that thoughtfully incorporated gaming motivators (p. 69). In structural gamification, content remains the same as in traditional learning, but reward elements, such as points, levels, or badges, are added to motivate the learner (Kapp, 2014).

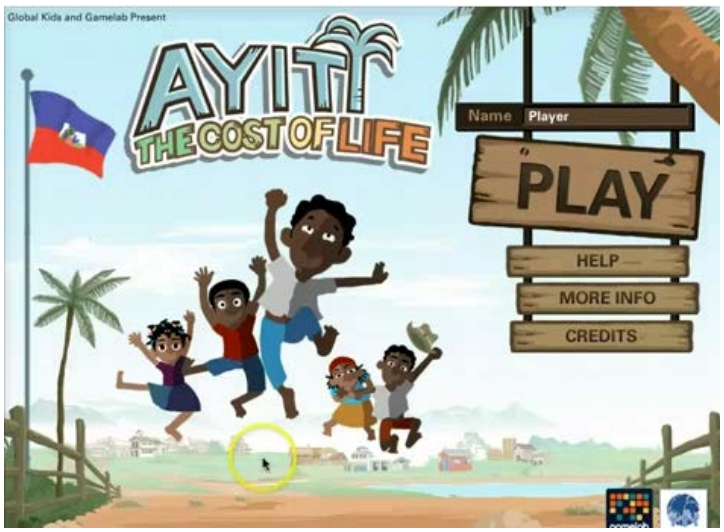
Creating low-risk challenges matched with rewards or leveling up is another way to look at implementation of gamification. It’s not the novelties in video games that increase engagement, it’s the challenges built into the game design (Barker, 2014, p. 76). Challenges can be designed that require the collaboration of multiple learners to achieve success. Another individual game element to use in a non-game context is a goal or series of goals that have rules to follow yet also provide choices for achieving success by allowing choices for learners to take different paths to reach the goal. Leveling up and creating scaffolded instruction that allows for multiple attempts to reach mastery, as well as frequent feedback, is another game element to consider in gamifying education. Feedback gives learners in a gamified environment the opportunity to alter their behavior (Kapp, 2013, p. 170) in a way that fosters success.

Implementation examples

Example 1

Ayiti is an example of gamification that uses gaming components to teach students poverty in Haiti. From their website, the following are the listed learning outcomes for Ayiti:

- Understand the conditions in contemporary Haiti and how poverty is an obstacle to education.
- Develop problem-solving, critical thinking and such life skills as resource management, budgeting, and planning for the future.
- Learn about ways in which they can advocate for action to confront poverty and increase access to education in Haiti.
- Share the achievements in the game with friends.



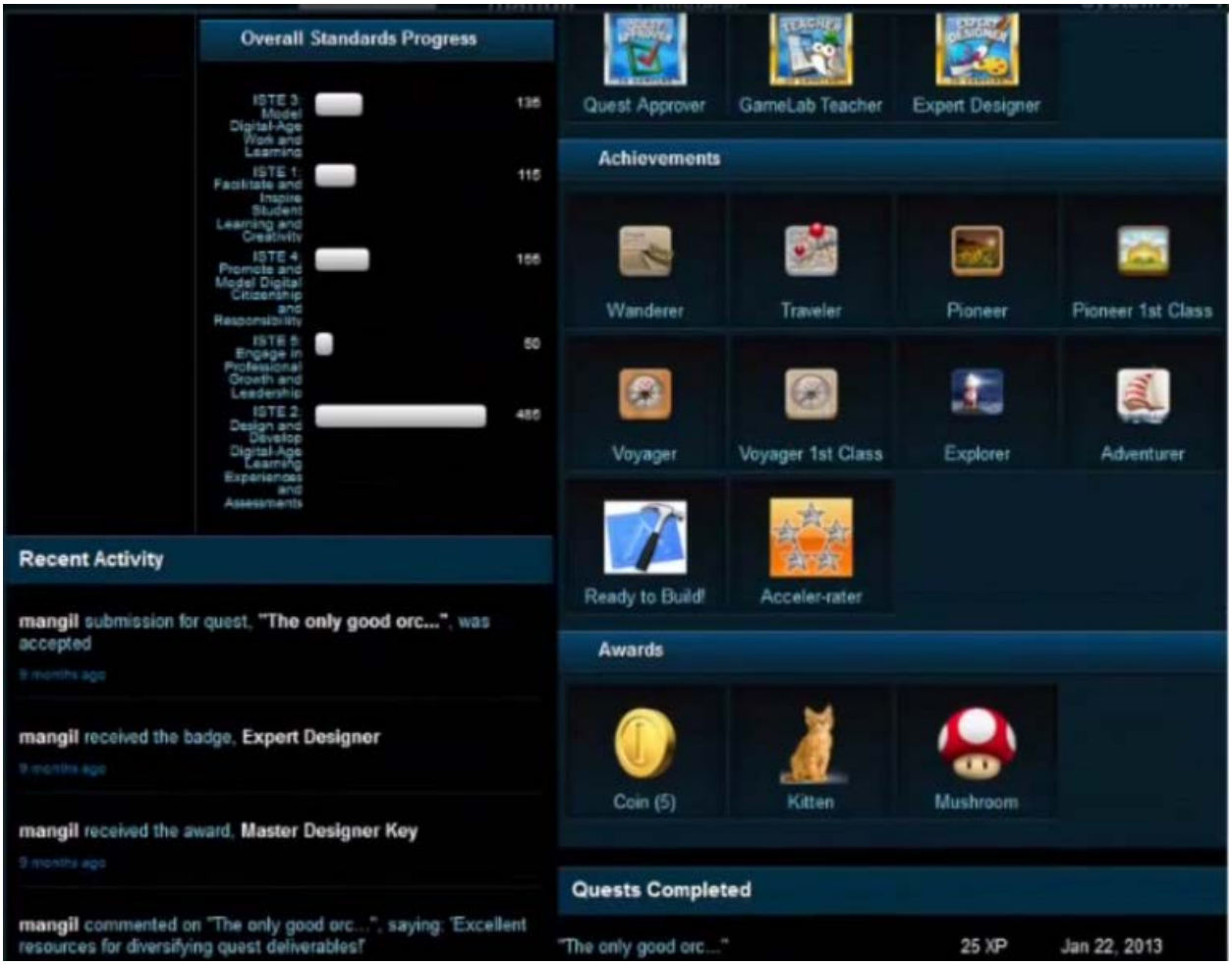
https://www.youtube.com/watch?v=Gch1e3SyGmo

Example 2

The game Jeopardy has been implemented in the classroom for many years in many different ways. There are free downloadable Jeopardy templates as well as software.

Example 3

3D Game Lab uses online quest-based learning in combination with badges, ranks, and levels to transform traditional content into gamified learning. It has been used with students ranging from middle school to college. An overview is presented in this video:



https://www.youtube.com/watch?v=IOegU7ydiJA#t=25

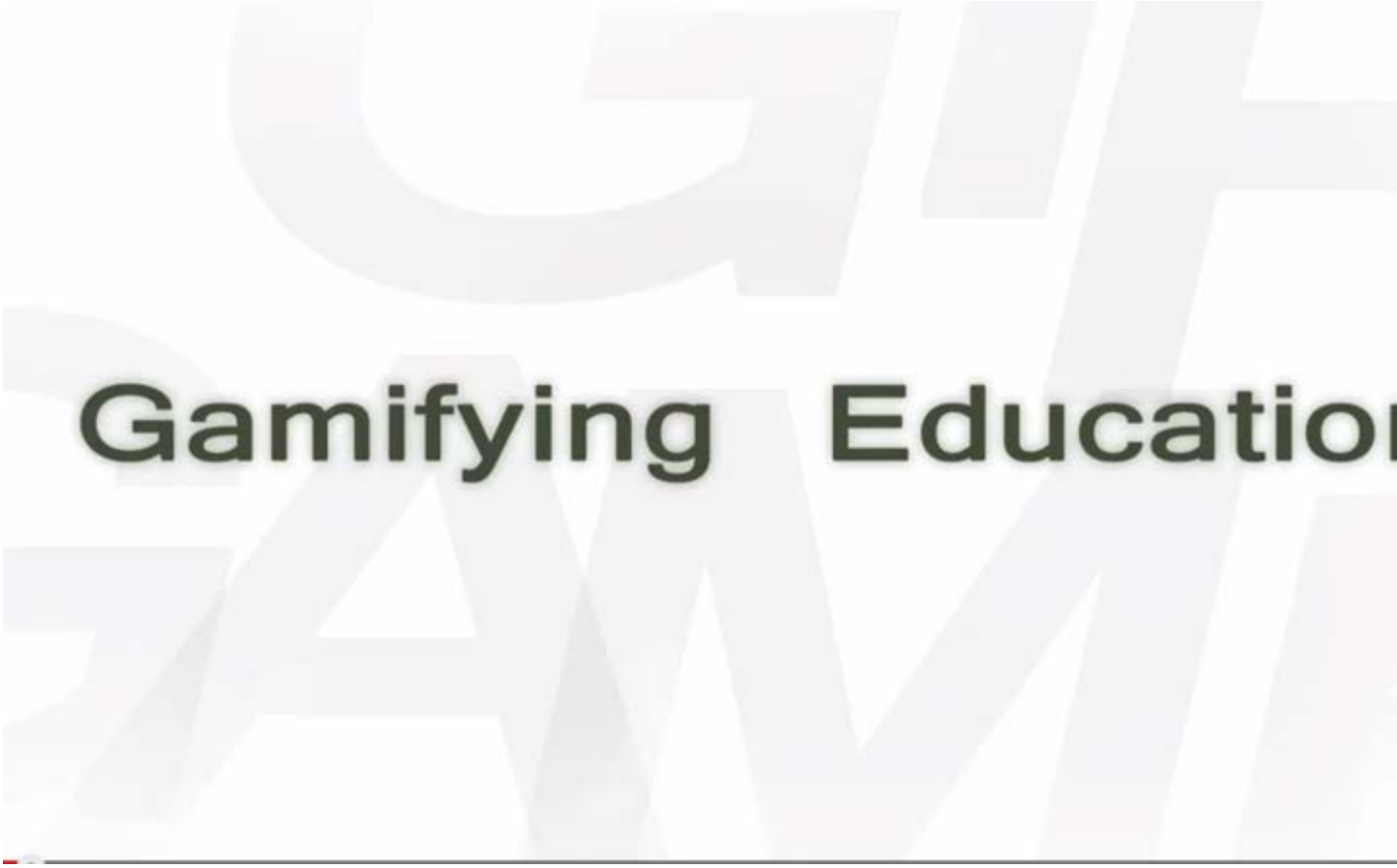
Criticism of gamification

As mentioned above, the bulk of criticism for gamification centers on extrinsic motivation and critics believe that gamified learning is too “manipulative” (Kapp, 2013, p. 337) because it uses technology and rewards to control the behavior of learners. Technological problems and unanticipated usability issues can further reduce students’ motivation and engagement in a gamified learning environment. For example, if technology used for gamification is

not compatible with some users' systems, if the technology is clunky or hard to understand, or if a lack of captions on audio prevents those hard of hearing from fully engaging, learners' frustration can impede success of the gamified experience. Finally, some students don't like to compete and don't like the especially public nature of scholastic competition, such as leader boards, thus reducing their motivation and engagement (Dominguez et al., 2013, p.391).

Educational paradigm

If didactic teaching can be described as "dreadfully predictable" and "deadeningly banal" (Kalantzis & Cope, 2012, p. 42), then most learning situations that embrace gamification could not be considered didactic. However, if only a basic element of gamification is employed, such as the use of stickers for rewards, without other changes to the pedagogy, then gamification could be considered didactic or authentic depending on the situation. Gamification is usually an example of transformative learning. Gamified learning strives to include learner choice and multiple ways to find success. The learner cooperation built into gamification as well as the frequent feedback as opposed to dualistic "right" or "wrong" answers further contribute to gamification being considered transformative. Because of its usual reliance on technology, gamified learning can take place in many different types of physical settings. Even though there could be clear right and wrong answers in a gamified learning experience as well as explicit rules and instructions demanded of gamified learning, gamification could still be considered an example of transformative learning.



Gamification: a video: https://www.youtube.com/watch?v=MuDLw1zIc94

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