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Gamification in Education

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Abstract

The purpose of this research is to provide how gaming mechanics, called gamification, can help engage students in education. The research looks at well-known gamification enthusiasts' point-of-views, gamification models, and tools to create gamification. The research findings presented brings to light the lack of motivation problem in education. As education requires constant change in the way of teaching, gamification offers unique insight into intrinsic motivation. The findings presented may be useful in engaging student learning, not just by the memorization of facts, but by presenting a motivational educational environment.

1. Introduction

Gamification: What is it

"Gamification is the use of game mechanics and game design techniques in non-game contexts."

–Mashable.com

***Figure 1.** Gamification in a Nutshell.*

"The use of gamification is to apply gaming techniques to non-gaming situations. Education, work training, business development, health practices and much more falls into non-gaming situations. Gamification is used to engage a user through motivation. The desired outcome is for the user to exhibit a new behavior or encourage a new one. Although, the explanation may be simple in many situations, there is much more that goes into gamification than just applying gaming techniques." (Gonzales, 2014.)

In education, students would be engaged through gamification, while learning the meaning of intrinsic motivation by exhibiting new ways of learning. Gamification gives

educators the tools to engage students in many different ways, which triggers new thought processes and behavior towards learning."

2. Gamification Psychology

"*Gamification is 75% Psychology and 25% Technology*" – Gabe Zichermann

2.1. The Motivation Trifecta

The fundamental elements, also called The Motivation Trifecta, in gamification are autonomy, mastery, and purpose.

- Autonomy gives the indication of trigger and encouragement.
- Mastery means user ability and progress.
- Purpose is the deepest motivation which keeps a person engaged and the reason for doing the task.

2.2. Maslow's Hierarchy of Needs

In 1943, Psychologist, Abraham H. Maslow published Hierarchy of Needs. The Hierarchy of Needs represents motivation at its finest. Each level represents the needs of life. As a person goes up a level, true motivational instincts will want to reach a higher point.
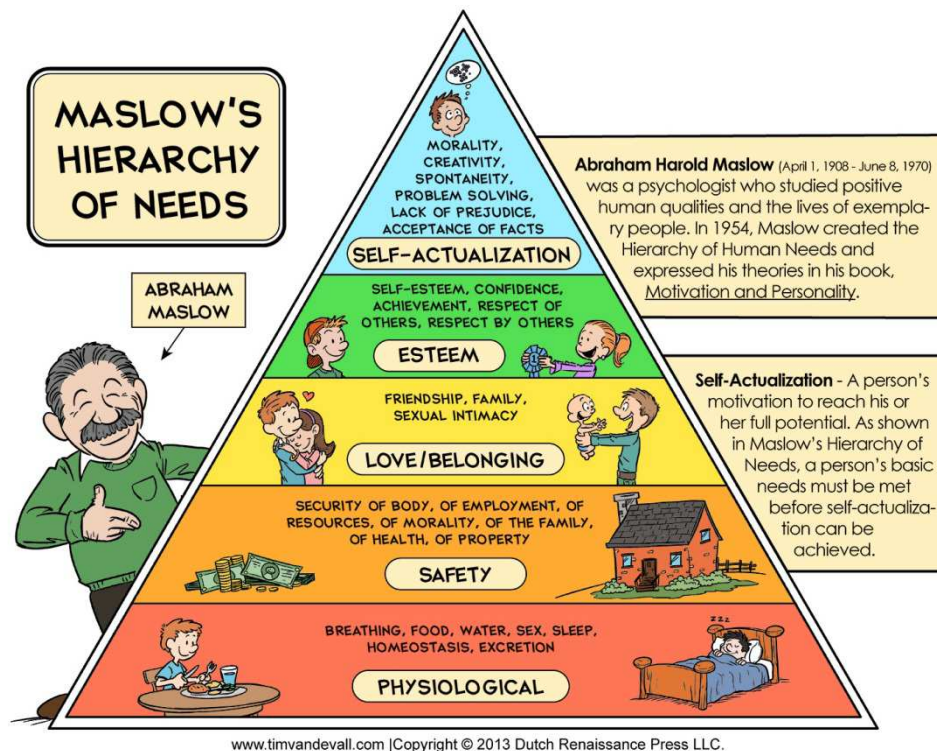
Figure 2. Maslow's Hierarchy of Needs Chart by Tim van de Vall.

Maslow believed that each level of needs must be met in order to move higher in life. For example, once a person has food, shelter, health, and clothing they can move to safety. However, if a job is lost and that safety is gone, an individual will to be motivated for physiological needs again in order to survive. Maslow laid out the foundation of human basic needs in a simplistic manner. This foundation is also used in gamification and gaming. A player will naturally want to progress on some level of both mechanics. The desire for achievement when playing a game is almost instinctive.

2.3. Daniel Pink's Book

Drive: The Surprising Truth About What Motivates Us (2009)

"Pink hypothesizes that in the modern society where the lower levels of the Maslow's hierarchy are more or less satisfied, people become more and more motivated by other intrinsic motivators. These intrinsic motivators are precisely the meta-motivators that Maslow is referring to in the self-actualization level, and Pink specifically focuses on three:

1. Motivation: the person wants desperately to perform the behavior (i.e. he is highly motivated)
2. Ability: the person can easily carry out the behavior (i.e. he considers the behavior very simple)
3. Trigger: the person is triggered to do the behavior (i.e. he is cued, reminded, asked, called to action, etc.)" (Wu, PhD, 2011.)
4. Maslow's hierarchy of needs are directly related to Dan Pink's intrinsic motivators. Purpose, autonomy, and mastery are the reasons why a person would try to make their situation better. Without truly believing in a purpose, ability, and having encouragement anything in life can be tedious. With gamification, these are the same motivators to conquer the gaming mechanics.

Maslow (Self-Actualization): Morality, Knowledge, Problem Solving, Creativity
Daniel Pink: *Motivation* to Remain, Belief in *Ability* to Remain, *Triggered* to Remain
Gamification: *Mastered the game mechanics (Ranking, Helping Others, Exploration)*

Maslow (Esteem): Confidence, Achievement, Respect
Daniel Pink: *Motivation* to Progress, Belief in *Ability* to Progress, *Triggered* to Progress
Gamification: *Autonomy* means triggered to get status, *Mastery* means believing in ability to get status, *Purpose* means status is beneficial *(Achievements, Reputation, Status)*

Maslow (Belonging): Love, Friendship, Intimacy
Daniel Pink: *Motivation* to Progress, Belief in *Ability* to Progress, *Triggered* to Progress
Gamification: *Autonomy* means triggered to interact, *Mastery* means believing the *Purpose* interact is beneficial *(Social Belonging, Community)*

Maslow (Safety): Employment, Health, Resources
Daniel Pink: *Motivation* to Progress, Belief in *Ability* to Progress, *Triggered* to Progress
Gamification: *Autonomy* means triggered to try, *Mastery* means believing in ability to try, *Purpose* means reason to try *(Learned the fundamentals of the gaming mechanics)*

Maslow (Physiological | Foundation): Food, Water, Shelter, Sleep
Daniel Pink: *Motivation* to Progress, Belief in *Ability* to Progress, *Triggered* to Progress
Gamification: *Autonomy* means triggered to learn, *Mastery* means believing in ability to learn, *Purpose* means reason to learn *(Learning the game mechanics to eventually master them. This would be the foundation to start, learn, and try.)*

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Figure 3. *Maslow, Pink, and Gamification Coming Together.*

2.4. Andrzej Marczewski's RAMP & Intrinsic Motivation

Relatedness, Autonomy, Mastery, Purpose

Andrzej Marczewski, a gamification expert and world contributor, added to The Motivation Trifecta by making it a perfect Motivation Quadfecta. Mr. Marczewski adds Relatedness to the Motivation Trifecta.

"Relatedness is the desire to be connected to others. In Gamification it is covered by things such as social status and connections that come from communities. The sense of belonging and being connected to other people is very underrated. When you feel that you are part of something and create relationships, that is much stronger than any digital reward you may get from posting an article to twitter!" (A. Marczewski.)

Humans need each other and the sense of belonging is very important. However, enjoying the activity and enjoying social connection is huge part of relatedness. Just like autonomy, mastery, and purpose need to be present in order to for a behavior to occur; enjoyment needs to be present to participate in the activity.

Intrinsic Motivation is the catalyst in successful gamification and its implementation. Andrzej Marczewski gives the best definitions for the words intrinsic and motivation. He states intrinsic means "belonging to something or someone as an inherent and essential part of their nature." He also says "motivation causes or stimulates a person to act or to be the underlying cause of an action. Therefore, intrinsic motivation is a drive that comes from

within, not from external (extrinsic) sources such as rewards." (A. Marczewski.)

For example, if a person enjoys playing World of Warcraft, but doesn't like other players the social aspect may be limited for them. The person may alienate themselves which is not conducive to the progress of the game. On the flip side, if a person does not like playing World of Warcraft, but enjoys the people relationships are formed which provides motivation to continue.

3. Gaming Techniques

3.1. Gamification Target Audience

The psychology and intrinsic motivation in one target audience may be different than another group, therefore, gamification components will be different for each group. For example, gamification components to engage grade school children will be different than engaging high school students. The target audience needs should be considered before any components are created.

3.2. Gaming Personality Types

"The best Gamification is audience-specific. Bartle's Player Types theory has classified types of gamers into 4 types; Killer, Achiever, Socialiser and Explorer.

Gamification isn't a magic pill. Adding few points, few badges and a leaderboard won't help you take the leap. Designing an effective and captivating gameplay need a

thoughtful strategy. But you also need to learn by testing out different versions and learning which one engages your users the most." *(Rathi, 2013)*

Gamification uses the context of each player type to incorporate into the mechanics in order to keep motivation, purpose, and ability level in check. The audience, player types, and clear purpose must be defined to begin creating the game mechanics.
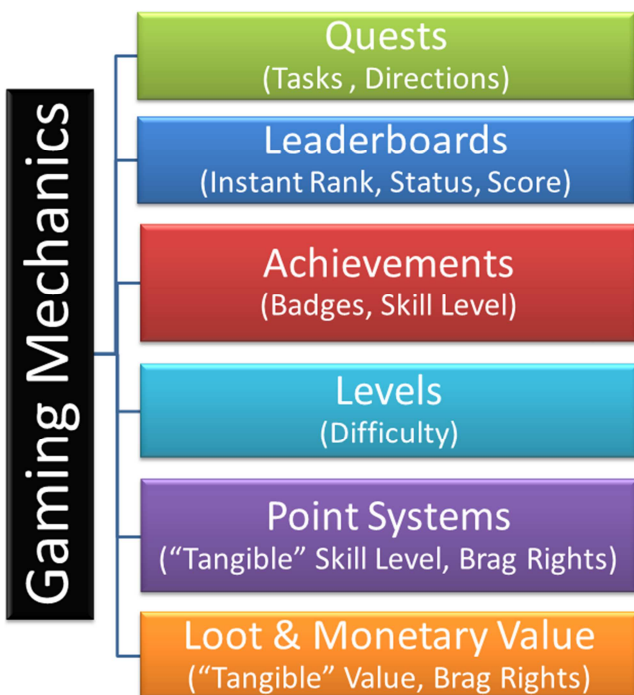

Figure 4. Bartle's Character Theory.

3.3. Gaming Mechanics

The fundamental components in gamification are quests, leaderboards, achievements, levels, point systems, loot, and monetary value.

Figure 5. Gaming Mechanics.

4. Gamification Study & Research

A study was conducted in 2014, consisting of 18 females and 11 males, on whether or not gamification and gaming would motivate students to learn if introduced in the classroom. The survey had received responses from high school graduates that indicated that gamification and gaming mechanics would increase engagement and motivation.

5. Conclusion

In conclusion, education should include classroom gaming mechanics to increase engagement, motivation and learning.

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