Towards a playful education

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Extended Abstract

In the recent decades there has been significant investment in the incorporation of games in the educational practice. This has taken either the form of game-based learning or serious gaming. Today, a literature research on gaming and education results in numerous works tackling different aspects of the approach. Even a simple search on the Web on "gaming and learning" produces multi-million results. In this work we try to touch not only the surface of this paradigm and provide typical game-based learning evaluation results but also to explore its inner workings and provide an even more concrete foundation of a playful education.

Playing is an archetypical activity that arises from primordial biological structures existing before the conscience or the capacity for speech; it is not something a person decides to do [1]. According to the same study, playing is an activity with specific qualitative features that could be summarised to the following:

- It is seemingly pointless (say, it is not being pursued for money or food)
- It is voluntary
- It genuinely attracts (makes a person feel nice)
- It releases from time
- It reduces self-consciousness (one does not care how he looks beautiful, smart, etc.; even stops thinking about thinking)
- It enhances improvisation (may even lead to ideas for other activities)
- It creates a desire to go on and on

In addition, according to Scott Eberle[1], vice president for play studies at The Strong National Museum of Play[2] and editor of the American Journal of Play[3], playing could include:

- Anticipation (what will happen)
- Surprise (the discovery, the unexpected)
- Entertainment (pleasure)
- Understanding (new knowledge or synthesis)
- Power (coming from the understanding of the world through the experiences)
- Balance, grace, poise

Following the definition of play, let us know consider if playing can be a positive activity and explore the scientific approach to this issue. Neuroscientists Sergio Pellis and Andrew Iwaniuk along with biologist John Nelson in their research [2][3] discovered strong positive association between the size of the brain with the propensity to play in mammals in general. Senior researcher of play Jaak Panksepp in numerous works as in [4] has shown that participation in playing selectively activates a brain derived neurotrophic factor (which stimulates growth of neurons) in the amygdala (where emotion processing takes place) and in the dorsolateral prefrontal cortex (where executive decisions processing takes place). The animal play expert John Byers [5]-[7] speculates that during play, the brain creates a sense of self through simulation and testing. The play essentially helps in the formation of the brain.

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[1] https://www.psychologytoday.com/experts/scott-g-eberle-phd
[2] http://www.museumofplay.org/
[3] http://www.journalofplay.org/

During the play the brain is able to experience situations without threatening its physical or emotional integrity. Neuroscientist Marian Diamond and her colleagues in the landmark 1960 survey [8] reported the development of rats with larger and more complex brains using play: the rats just played in a constantly changing environment of "toys" with intense socialization (not like in typical experiments in solitary mazes). According to Brown [1], the genius in play is that while playing new cognitive combinations are being created using fantasy. In creating there now cognitive combinations, the knowledge of the function of this world emerges. Playing seems to be an advanced method devised by nature to support a complex brain in its attempt to self-develop.

A question that naturally emerges from the previous analysis is that, if playing is a simulation mechanism what is being simulated?

According to Thomas Metzinger [9], there is an objective world out there, but as we try to make sense of it using unconscious filtering mechanisms, we are creating our own interpretation of the world, our own "reality tunnel". We are never in touch with the objective reality as those filtering mechanisms (senses, the brain, experiences and hypotheses) prevent from seeing the world as it is; we only see what can be seen through the reality tunnel we construct in a process that is totally transparent to us. We know the world using reflections, since a (correct) reflection is ultimately what we call knowledge. Each one lives in a virtual world, with the conscious experience being a virtual reality created by nature as a real-time and ever operative world model that supports the interaction between living organisms. In this world model, the ego is nothing more than a pointer on a space-time map, putting a self on the stage of time and space that defines the now and the where.

Surprisingly, according to all these researches, we seem to be living in a simulation (created by our brain) and we use play in order to simulate additional possible realities in a protected manner, without even noticing. So, play could be envisaged as a tool to explore potential realities in an attempt towards understanding of the world and towards self-discovery and self-development. It seems valid, in this respect, to adopt an approach towards gamification in education (as in other fields also). According to Scott Nicholson of *Because Play Matters Lab*[4], gamification is the nothing more than the use of specific approaches and techniques in various environments in order to attract people in problem solving and in contribution enhancement. Gamification draws its theoretical framework on various approaches including:

- Self-determination theory / organismic integration theory
- Situation relevance
- Universal design for learning
- Player-created content
- User-centred design

Nicholson also commented the distinction between *Play* and *Game* using a "playful" mathematical approach as follows:

$$Game = Play + Goals + Structure \implies \begin{cases} Game - Play = Goals + Structure^{[5]} \\ Play = Game - (Goals + Structure)^{[6]} \end{cases}$$

In an attempt to establish that gamification actually produces positive outcome, recent studies have concluded that gamification is expected to produce positive results [11], although there might be some differentiation in personal and contextual level [12] related with the continuous usage (the more the usage the less the perceived positive value) and the gender

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[4] *Because Play Matters Lab http://becauseplaymatters.com*
[5] *BLAP gamification model (badges, levels, achievements, points)*
[6] *Solution for Play: emphasis on the play and the player*

(women showed a greater social dimension than men in perceived positive value). In any case the study showed there is no difference whatsoever with the age, i.e. regardless of the age the perceived value of gamification is the same. It should be noted here that there is a light distinction in gamification and game-based learning, as in the second there is a specific targeting towards the learning process.

In this respect, educational games are games that are either those expressly designed for educational purposes or those with educational value that emerges randomly or secondarily. These games are being designed to aid in learning about specific subjects, in expanding concepts, in stimulating growth, in understanding a historical event or a culture, in developing a skill while playing. All kinds of games can be used in an educational environment.

The above analysis thus supports a conclusion that play in education is a well-established paradigm not only because studies have indicated so and not only game-based learning project have shown positive evaluation results, but mainly due to the nature of the inner workings of the process of play, towards self-development and the acquisition of knowledge and the understanding of the world.

Acknowledgements

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