

Serious Games: Amaz(e)ing Brain

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I. INTRODUCTION

The way we comprehend intelligence today is rooted way back in history. From Ancient Greece to the era of "Enlightenment" people have tried to create a footing for knowledge by introducing the terms logic and critical thinking as the only truth (Cogito Ergo Sum). Logic thinking shaped the basis of theories across many fields one of them being the anthropological sciences which entirely affect education. Influenced by the industrial revolution, people responsible for the education reform, created simple and easy ways of evaluating a person thus industrializing the educational process. The notion of intelligence is today coined with this way of evaluation; logical thinking above all. Intelligence was defined by strict mathematical and orthological terms leading to evaluation that can even quantify the amount of intelligence a person has, e.g. IQ tests. Even today, we value logic above all, effectively making a test at school being able to distinguish the smartest students which are also the ones who deserve special treatment. Especially for children, such tests can be prove to be fatal for their confidence and their healthy development. Moreover, it is always hard for a parent seeing their child fail even if it simply has a different way of thinking. Confidence is one of the greatest gifts one can have, especially confidence for one's intelligence. This paper describes a prototype which can be used as a tool to provide such confidence to an individual by using an alternative way of evaluating intelligence namely multiple intelligence. The main point which will be discussed is that intelligence is not linear and cannot be quantified simply with an IQ test. It is multidimensional. Two people with the same IQ results may or may not accomplish the same things in life. Intelligence is a fingerprint. People can think with colors, sound, movement, numbers and feelings.

II. MULTIPLE INTELLIGENCE

Educators have come to realize that people all think in different ways. Different ways of thinking are necessary to solve different types of problems. In 1998, Howard Gardner suggested that there are eight different and independent types of intelligence, a theory now known as "Multiple Intelligence Theory". The theory follows the constructivist model of learning. People possess several intelligences which learners use to process and interpret information.

I. Linguistic

"Word Smart" involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals. This intelligence includes the ability to effectively use language to express oneself rhetorically or poetically; and language as a means to remember information. Writers, poets, lawyers and speakers are among those that Howard Gardner sees as having high linguistic intelligence.

II. Logical-Mathematical

It consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically. In Howard Gardner's words, it entails the ability to detect patterns, reason deductively and think logically. This intelligence is most often associated with scientific and mathematical thinking.

III. Visual-Spatial

Visual Spatial Intelligence is defined by Gardner (in 'Frames of Mind') as the ability to perceive the visual world accurately, to perform transformations and modifications upon ones initial perceptions, and to be able to re-create aspects of ones visual experience, even in the absence of relevant physical stimuli

IV. Musical

Involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms. According to Howard Gardner musical intelligence runs in an almost structural parallel to linguistic intelligence.

V. Bodily-Kinesthetic

Entails the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements. Howard Gardner sees mental and physical activity as related.

VI. Interpersonal

This type of intelligence is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others. Educators, salespeople, religious and political leaders and counsellors all need a well-developed interpersonal intelligence.

VII. Intrapersonal

Entails the capacity to understand oneself, to appreciate one's feelings, fears and motivations. In Howard Gardner's view it involves having an effective working model of ourselves, and to be able to use such information to regulate our lives.

VIII. Naturalistic

This intelligence has to do with observing, understanding and organizing patterns in the natural environment. A naturalist is someone who shows expertise in the recognition and classification of plants and animals. This could be anyone from a molecular biologist to a traditional medicine man using herbal remedies.

III. AMAZ(E)ING BRAIN - GAME PROTOTYPE

"Amaz(e)ing Brain" is an online HTML5 serious game which one can play to discover his own multiple intelligences. After answering a series of question the application is able to calculate a score and visualize one's potent multiple intelligence. The game was created using Construct 2

which is an GUI for developing HTML5 games, making the process of development easier. To visualize the results as a radar chart, the D3 Javascript framework was used. The structure of the game is in form of a quiz. The player is presented with a general question of preference and personality. There are multiple answers and the player needs to choose two of them. The quiz questions, answers and score system that are used reflect exactly to the "Theory of Multiple Intelligence". The initial idea was to provide certain stimuli as an extension to the questions as well as mini-games. For example, identifying if two sounds played are the same note even if in different key. However, due to heavy workload the simpler prototype serving as proof of concept was developed having only the quiz-like part. There are a few questions in the prototype version, however in a more developed game, the questions should be at least 10 which means 20 answers, leading into more precise result. The visualization serves as an easy in-a-glance insight into one's strengths and weaknesses. Furthermore the player can interact with the graph which depicts the exact scores upon hovering the mouse on the points in each partition which represents the corresponding intelligence. Finally, as an extension to the games mechanics, the results are exported using the browser cookies technology in order to store the result information so that they can be made available upon website visit, thus the visualization is also stored in a different page.

The game can be used as a great tool which can aid parents and educators to give purpose in learning activities in order for them to become interesting as well as positively affect the child's cognitive and emotional development. Moreover, the game can be used to boost a person's confidence and enlighten him with the fact that people think different and there are various ways of being smart. Such a framework can provide insight into one's weaknesses and strengths. A person can use his strengths to develop a more effective learning process by using this knowledge in his advantage. For instance, a person with high musical intelligence could use rhythm and music in order to learn something new. Ideally, a person should have a balance between his eight intelligences. Using the game one can focus his time practicing skills associated with his weaker intelligences. The important part is to not only practice math but other skills as well. Music cognition, empathy, pattern observation and so on. There are a lot of people who are considered to be extremely smart yet lack many of those skills. A game like "Amaz(e)ing brain" might help them realize how far behind they are in such aspects of their personality.

IV. CONCLUSION

We described an alternative way of evaluating the smartness of a person, namely multiple intelligence. By creating a game which attempts to discover a person's abilities the goal is to improve the quality of people's lives and boost their self confidence. Being able to collectively solve problems by acknowledging different ways of thinking may prove to be an extremely efficient way of achieving Utopia.

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