Testing Engagement Improvement in the Serious Educational Videogame: *Cerebrex Ultimate*

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Abstract: Videogames can be effectively used in an educational setting to improve grades, IQ, motivation and learning. In this paper, we improve upon a previous SEG in order to enhance engagement using both intrinsic and extrinsic motivators. Using in-game improvements, events that break the fourth wall, classroom, school and instructor led activities. The standard and improved version of *Cerebrex* was tested with 6th graders in two private elementary schools in Guatemala City. The children in the control group played the standard version while the experimental group played the enhanced version for ten weeks. The results show that the children who played the improved version registered an increase in the total number of games played of 200% and 1000%.

Introduction

It has been argued previously that games can be used as a force for good (Przybylski, Rigby, Ryan, 2010; Ferguson, 2010), and have successfully increased grades, IQ, motivation and learning (Baranowski, Buday, Thompson, & Baranowski, 2008), (Lemus, Baessa, & Garcia 2014). Still an open question is how to make games fun? There are researchers who warn us to stay away from what has been coined “chocolate covered broccoli,” while other researchers argue that the educational system is compulsory so it is OK to use extrinsic motivation to motivate play. We believe the game must be fun in itself - intrinsic motivation (Deci & Ryan, 1985) but also can use extrinsic motivators to attract student attention and bring them to play.

The improved version of *Cerebrex*, henceforth called *Cerebrex Ultimate*, included many motivational improvements, including better graphics, improved stability since most bugs were fixed, a customizable player character, various types of items that would alter game mechanics such as armor and weapons, weekly in game events amongst others. Additionally, posters were placed in school bulletin boards with game elements, especially game relics, and a special poster with the weekly top 10 players was posted in-class where grade teachers would congratulate the player with the best score and the most constant player.

Objective

The main purpose of the current study is to assess if the improved version of the serious educational game *Cerebrex* would enhance engagement measured by how many games the children played.

Methodology

Participants and Setting

Data was collected for two upper class private elementary schools in Guatemala City hereafter called school 1 and School 2. School 1 was an all-boys school which had 35 participants in each group. School 2 was an all-girls school with a total of 20 participants in each group. Average age for both schools was 12 years old which ranged from 11 to 13 years old.

Instruments

The standard *Cerebrex* game was used for the control group while the experimental group used the enhanced *Cerebrex Ultimate*. Both games record user interaction with the game, so usage statistics was derived from the logs in each game. Training on how to use the game was provided to the students before engaging in the experiment.

Procedures

The first phase lasted 10 weeks where the control group would play the standard *Cerebrex* game in school 1 & 2. The second phase also lasted 10 weeks and the experimental group played the improved *Cerebrex Ultimate*. Before beginning the second phase, we started placing *Cerebrex* posters throughout the school creating an ex-

pectation campaign. We also agreed to send a weekly report to the teachers so they could congratulate in person the player with the best weekly score and the most constant player.

Results

Games played are the total number of games the students completed during the 10 week interval (Table 1).

	School 1: Total Games Played	School 2: Total Games Played
Cerebrex	284	549
Cerebrex Ultimate	3062	1032

Table 1: Total games played during both phases in each school.

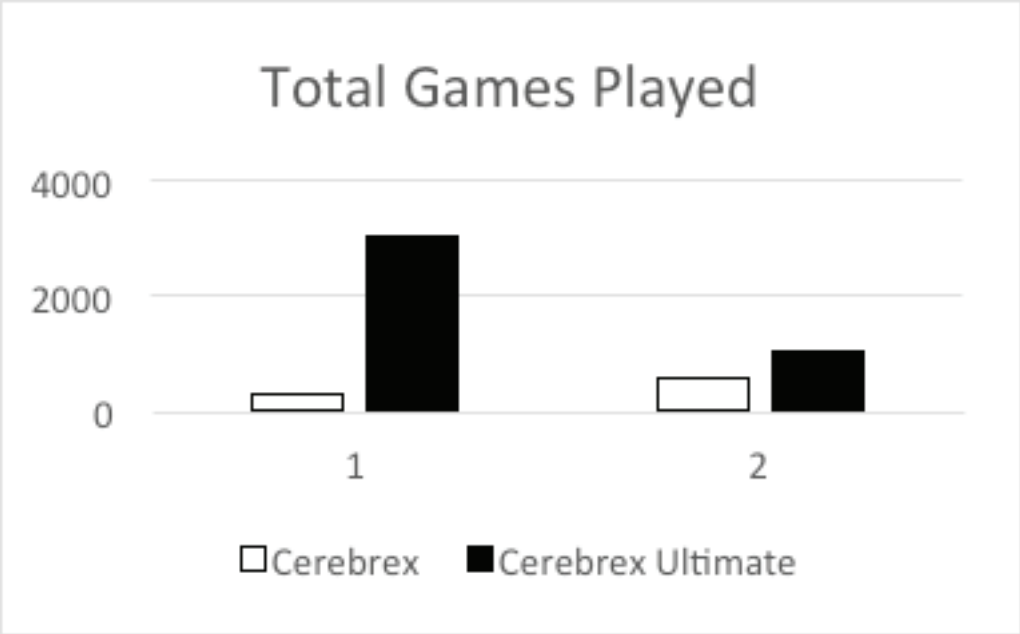

Figure 3: Comparison of the total of games played between schools.

Conclusions

Both Figure 3 and Table 1 clearly state a high increase in games played. This indicates that the improvements implemented in *Cerebrex Ultimate* translated effectively into more games played and that combining intrinsic/extrinsic motivators can improve engagement.

References

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