

Assignment 3 – Project Proposal
Research Track: Traditional Gaming and Education
Krit Petty – Summer 2018 CS6460

Background Information – Research Track

The popularity of video games in young people's lives has risen from a small hobby only seen in arcades to be a \$108.4 billion revenue industry in 2017 [1] that is in nearly every young person's home or school or cell phone. To put that in perspective, the international box office total for film revenue for 2017 was a mere \$39.9 billion [2]. This leads to the question about how these video games are affecting young people's minds and their ability to learn. There have been many studies on the psychological impact of video games in the recent decades, but not as much time spent looking at how academic development has been affected.

There are several ways that young people engage with video games. One major method of incorporating gaming into the field of education is the idea of "**gamification**." A group of researchers have defined "gamification" as the following: "...the use of game design elements in non-game contexts" [4] (Deterding, 2011). Whether or not gamification is useful is still under debate, but many companies, workplaces, and schools have attempted to gamify different processes to hopefully improve engagement with topics people usually struggle to stay engaged with. A prominent success of this is the gamification of most fitness apps that reward badges, milestones, and achievements for continued workouts. Language such as "leveling up" is used to promote continued use of various apps. Even Amazon's Audible audiobook app award various rewards for different types of listening habits encouraging people to use the app more.

Another interaction with video games young people are now exposed to is called "**Educational Gaming**." This is the process of creating a game with specific goal to teach math and reading at a young age, or what I like to call the "Sesame Street" genre of video games. Almost all the research in this field is positive that children in school are engaged more in learning by playing the educational games [5][6][7][8]. Elementary schools across the United States use websites such as ABCya.com, raz-kids.com, web.stmath.com, app.typingagent.com, and many others to teach math and reading skills in a video game like environment. These websites are used daily in elementary schools and are linked in as required homework assignments because of how successful they have been.

My Proposal

Apart from these special type of video games listed above we have normal everyday video games that kids and adults choose to play for fun as a hobby rather than as a tool specifically designed for learning. This type of video games I'll refer to as "**traditional gaming**." Most the research I've found doesn't seem to address the topic of how traditional gaming effects the academic development of children. Does a video game diet comprised of Mario and Zelda, Roblox and Minecraft, or Halo and Call of Duty have any effects? Most video game research related to education focuses on the topics of gamification and educational gaming or it is treated as sub-category to research into how digital devices, such as web browsing, online video viewing (YouTube, Netflix, and others), cell phone use, etc. affect education.

The dearth of research specifically dedicated to this topic has lead me to want to investigate and research the following project:

“How can traditional gaming be utilized in education to improve children’s academic development?”

My hypothesis is that traditional gaming is already helping to improve children’s academic development, but the research needs to be done to prove it.

Research Proposals

My initial plans for doing further dedicated research in this field was to first generate various lists of the top selling video games in different categories (ESRB ratings, Console, Game genre, etc.). These lists would be further parsed and analyzed to come up with 10-20 most popular games per age group.

--- **Milestone 1:** Obtaining this data and drafting an initial survey based on it to be peer reviewed

Originally, I had planned to partner with several school districts, private schools, as well as a few home school subjects around the country (I’ve lived in Oregon, Utah, Idaho, Texas, New Jersey, and California and have connections to school administrations in many of those places) to send home voluntary questionnaires for children in many different grades for them and their parents to fill out together. However, due to the time of year, most school children in the United States are out of school for the summer. Additional methods of performing the survey will be listed in the next section.

As a backup to this method of obtaining information I do plan on looking at how many schools, clubs, youth groups, etc. that I can find that utilize traditional gaming games as a teaching tool in some way already. I am already aware of schools that have Minecraft clubs to stimulate creativity and learning. I plan to find what other resources like this are already in existence and find out the effectiveness of such groups by getting information from them.

The Survey/Questionnaire

An alternate approach to obtaining the information other than school surveys is as follows. I still plan on reaching out to the school administrations to see if any data can be collected, though the sample size will be much smaller and inherently more biased on people who are actively engaged with school functions or have specific feelings towards video games already. Other plans for distributing these questionnaires will involve sending survey’s out to OMSCS students who are also parents who have children in school, approaching local community centers such as the YMCA, or looking for summer schools or programs that I could partner with. Another option for obtaining results would be to setup a booth in local shopping centers or malls asking for volunteers to take the survey/questionnaire. To increase incentive in participation, I’d offer randomly selected participants a chance of an incentive such as a gift card to encourage participation.

It should be noted that all these methods of obtaining results will have some degree of participation bias. I don’t see any way around this as a fully researched topic of this sort would require having hundreds of test families of various incomes, living conditions, nationalities, and educational backgrounds participate with control groups and test groups of children who play video games and

children who do not over years of observation. Even then, the research would be hard to dissociate the results from cause/effect relationship to a correlative relationship. Such research topics would be suitable for PhD research time and scope but is not obtainable in the confines of a single semester. As such, my goal is to gain insight into the beginnings of this topic so that this research may be used as a catalyst for future research conducted at a larger scale by others in the future.

The questionnaire proposed would be separate questions for child and parent. The children's questions would mainly focus on which games they've heard of and which games they have played as well as which games are their favorite games. Depending on the age group, there may be some free form questions about why they like certain games. Most likely this survey would be digital in nature for ease of collecting results.

The parent's survey would ask questions about how many hours their children play video games in general and questions about the children's performance in school in various subjects of math, reading, writing, science, and whatever other information about the children's success in school they are willing to share. The goal of this questionnaire is to look for links in traditional gaming and academic performance.

--- **Milestone 2:** Performing the above survey and obtaining majority of results.

Analyzing the Results

Finally, the final stage would be to look at the obtained data of groups that are already utilizing traditional gaming in education and try to find correlations with how children perform in school. This will require reading through all the survey results, questionnaires, and any other information obtained to come to conclusions. I hope to be able to find trends that show an increase in academic performance through this process. A proposal would then be made on how traditional gaming, based on these results, could be used to further better the academic performance of all children showing the success of existing programs and the survey results, unless evidence gather goes against my hypothesis. I am full aware that the results of this research will be difficult to parse causation vs. correlation, but given the time frame and scope, I'm not sure how to avoid this.

Schedule of Tasks

My proposed schedule for the semester from here is as follows:

1. 6/17/2018
 - a. Initial Proposal
2. 6/24/2018 – Status Check 1
 - a. Gather Video Game sales data
 - b. Draft initial surveys
 - c. List survey participants and final distribution plans
3. 7/01/2018 – Status Check 2
 - a. Finalize survey based on gathered data, sent to peers for review (classmates)
 - b. **Intermediate Milestone 1:** Fully drafted survey to be peer reviewed completed.
4. 7/08/2018 – Status Check 3
 - a. Vacation Plans, will not accomplish as much this week.
 - b. Receive peer feedback and adjust surveys accordingly.
 - c. Begin distribution of survey to digital audiences

5. 7/15/2018 – Status Check 4
 - a. Face to face research gathering of data, survey collection at malls/shopping centers, etc.
 - b. **Intermediate Milestone 2:** Obtain and compile research results
6. 7/22/2018 – Status Check 5
 - a. Add in extra results obtained after 7/15
 - b. Begin analysis of results
 - c. Begin final paper draft
7. 7/29/2018 – Final Project
 - a. Present Results as a paper and Presentation

References:

1. Batchelor, James. (2018, January). *Games industry generated \$108.fbn in revenues in 2017*. Accessed at: <https://www.gamesindustry.biz/articles/2018-01-31-games-industry-generated-usd108-4bn-in-revenues-in-2017>
2. McClintock, Pamela. (2017, December). *2017 Box Office: Global Revenue Hits Record \$40B Even as Movie Attendance Plummets in U.S.* Accessed at: <https://www.hollywoodreporter.com/news/2017-box-office-global-revenue-hits-record-40b-as-movie-attendance-plummets-us-1070879>
3. Hamari, J., Koivisto, J., & Sarsa, H. (2014, January). Does gamification work? -- a literature review of empirical studies on gamification. In *System Sciences (HICSS), 2014 47th Hawaii International Conference on* (pp. 3025-3034). IEEE. Accessed at: <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6758978>
4. Deterding, Sebastian, et al. "From game design elements to gamefulness: defining gamification." *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments*. ACM, 2011. Accessed at: https://s3.amazonaws.com/academia.edu.documents/30609294/MindTrek_Gamification_PrinterReady_110806_SDE_accepted_LEN_changes_1.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1528083190&Signature=jfVxYPsZIXtjWanZ3pjPJZmXIP0%3D&response-content-disposition=inline%3B%20filename%3DFrom_game_design_elements_to_gamefulness.pdf
5. Rosas, R., Nussbaum, M., Cumsille, P., Marianov, V., Correa, M., Flores, P., ... & Rodriguez, P. (2003). Beyond Nintendo: design and assessment of educational video games for first and second grade students. *Computers & Education*, 40(1), 71-94. Accessed at: <http://www.psiucv.cl/wp-content/uploads/2012/11/Beyond-Nintendo.pdf>
6. Lee, J., Luchini, K., Michael, B., Norris, C., & Soloway, E. (2004, April). More than just fun and games: Assessing the value of educational video games in the classroom. In *CHI'04 extended abstracts on Human factors in computing systems* (pp. 1375-1378). ACM. Accessed at: https://www.researchgate.net/profile/Cathie_Norris/publication/221514634_More_than_just_fun_and_games_Assessing_the_value_of_educational_video_games_in_the_classroom/links/53f1f93b0cf2bc0c40e6f3f6/More-than-just-fun-and-games-Assessing-the-value-of-educational-video-games-in-the-classroom.pdf
7. Tüzün, H. (2007). Blending video games with learning: Issues and challenges with classroom implementations in the Turkish context. *British Journal of Educational Technology*, 38(3), 465-477. Accessed at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.469.1851&rep=rep1&type=pdf>
8. Shin, N., Sutherland, L. M., Norris, C. A., & Soloway, E. (2012). Effects of game technology on elementary student learning in mathematics. *British journal of educational technology*, 43(4), 540-560. Accessed at: <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/92095/bjjet1197.pdf?sequence=1&isAllowed=y>