

# EDUCATIONAL GAMING STATIONS

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## **Literature Review**

### *Games as a Means of Education*

There are a variety of articles that support gaming as a growing form of informal education. Whether it is computer games or console video games, they are a growing medium for educational purposes. In doing our research we encountered various articles that support the use of gaming as an effective educational tool, and why games are so effective.

In an article by Kolko and Putnam, their focus is on now about how the content of gaming can be educational, but how the act of gaming itself is an educational experience. They argue and prove based on a case study done in Central Asia, that the activity of gaming teaches players skills necessary for life. They argue that gaming is a two-fold experience—that children are able to learn from the content of the game itself, and from the activity of gaming. They also provide a close analysis of gaming to computers. Gaming does not require Internet access, and so it makes it more readily available to developing countries, and is much easier to setup. With that said, they also explain how games can often times act as introduction to ICT's. Because games are more readily available, they can often times serve as basic technology that kids are introduced, and through games, players are introduced to other types of technology. This suggests that gaming can have a huge impact from a developing country context.

Another article titled “Digital Games Basic Learning” provides information on how games increase competition, cooperation, push new results, and allow players to actively seek information. The article suggests that these are all motivational

skills, and if games are providing this sort of engagement, then doesn't it make the most sense to use games as an educational medium. The article suggests yes. These are all skills that push players and students alike to learn more, and actually engage in learning in the first place, and this is why we believe it can be effective.

In two more articles, we see the effect that gaming can have on education, and some more of the unique skills that are learned from gaming. In the article titled "Insight", they propose that games can serve as a homework assignment, a final test, and even a project. With that said, if this is the case, in some sense students and gamers can ultimately derive some sense of education from games, however, informal it may be. They provide examples of games that further Kolko's and Putnam's point, of a dual learning experience from games. Games such as Civilization, Revolution, and others based on history and literature that can help and have helped players learn. Another point that the Insight article brings up is that often times in these multiplayer games every player experiences it differently, and so when they talk about it with other people, they have a unique experience and perspective to share. This is all encouraging collaboration, teamwork, and community building. These three topics in particular are the focus of the second article by Kurt Squire. Where he talks about gaming is able to provide collaboration, encourage teamwork, and promote community building. One of the final points provided by the Insight article is that games allow for peer-to-peer teaching and allow for learning communities to develop. However, in order to move educational gaming to the next level, we must develop sustainable projects and continue to

measure their effectiveness while also doing research on ways to improve upon them.

Finally, one final article that we looked at relating to games was an article we read in class. In the article relating to HCI titled “Human Computer Interaction for Development: The Past, Present and Future”, we found that just pushing a game or some sort of project to a developing country might not be the best thing. We realized that they might reject the games because they are too westernized or not in sync with their culture. One of our takeaways from this article was that any gaming experience or project that we do provide to a community has to be tailored to fit the culture of the community or the community expectations. What we mean by this, is that we want to provide communities with education respective to their culture, we don’t want to impose any western traditions or concepts of life specific to western culture on any developing country that doesn’t want it, or isn’t ready for it. We want to preserve the uniqueness and focus of each culture, but at the same time educate them and try to improve their quality of living.

#### *The Problems with Current Education Systems*

The second half of our sources focused on reasons for the overall lack of education in developing country. Ultimately, we found that time, cost, and child labor were the biggest contributors.

One of our articles by Joseph Chimombo focused on the opportunity cost of schooling. The fact is that families that are in poverty lose out on money when their children go to school as opposed to work. There were cases where children were

contributing up to 1/3 of a family's income by working instead of going to school. This means that children are an economic source for poor parents. In cases where the government did subsidize education, education witnessed an increase in participation, but child labor was not significantly affected by it.

For the purposes of our project, we looked at Ghana in general. This led us to find numbers on the percentage of household incomes that child workers are contributing too, as well as looking at the number of children not going to school at all, or working as well as going to school.

All of these articles suggest that education is a problem in developing countries because of a lot of obvious reasons. Time, cost, poverty, and lack of availability—these are all problems that developing countries face in regards to schooling. While there is not necessarily a direct way to address it, our solution aims to provide an alternative means of education, without interfering with the dynamic of the current country system.

### *Alternative Approaches*

Based on all of our research, and the information provided, we have found several other solutions that we feel try to address the issue of education, but are not as effective as they should be. One of the first alternative solutions we encountered was TeleCenters/Kiosks. These are already a feasible option, but they fall short in certain developing countries. This may be because the need of each developing country is different. It could also be that not each developing country has the same technology proficiency level, and so they are unable to completely gain the benefit of

technology. With that said, we look at our project as a modification of TeleCenters because it doesn't really require any proficiency to be able to play a game, but they can still gain the same sort of educational experience they might from a computer.

Another solution we encountered was government subsidies for education. We read a few articles where the government actually subsidized education to see the impact that it would have. What the article found was that while kids did participate more in education, there was still a significant percentage of children not participating in education, because of issues like child labor. However, this did suggest that cost is a very important factor when it comes to parents sending their children to school.

One final alternative approach that we encountered is a project that already exists between Microsoft and MIT, where they have collaborated to develop these educational games, while it may not be a direct alternative; it suggests that games for an educational purpose have been seen as a powerful idea. The project itself titled "Games-to-teach" does not necessarily focus on developing countries, but it does provide games on specific educational topics such as science, math, and literature.

### **Problem Statement**

The opportunity cost of formal education for children in rural regions of developing countries is often too high for their families to incur. Several studies have shown that rural families depend on their children to economically contribute to the household. In many cases, childhood participation in these income-

generating activities eradicates their opportunity for a formal education. Further exacerbating the problem, many governments in countries where these cases are prevalent lack the capacity to enforce laws that require children to attend school. Consequently, innumerable quantities of rural children throughout the world grow up without the opportunity to receive an education of any sort.

Despite the efforts of philanthropist, NGO's, and governments to bolster childhood education in these communities, the immediate economic needs of these families continues to prevent children from attending schools at alarming rates. Several governments have subsidized schools to help families send their children to school with moderate success. However, the direct economic cost of attending school is not the primary factor that prevents these children from attending school. Research has shown that 'even when schools are accessible and affordable, families have to see a net advantage to themselves and to their children from forgoing children's full-time participation in domestic and economic activities' (Lloyd & Blanc, 1996). This research suggests that the opportunity cost of time spent in school weighs more heavily than the actual cost of school when families choose not to send their children to school. Furthermore, the research shows that many rural children that live in proximity to affordable schools abstain from attending them.

Organizations and governments have invested substantial amounts of time and money for increasing access to formal education in these rural communities. Their efforts have facilitated educational opportunities for many rural children. However, they have failed to address a key issue for a plethora of families in these communities; the lack of available time these children have to attend formal

schooling due to their family's economic needs. Philanthropist, governments and NGO's alike must break from their traditional line of thinking to provide access to some form of education for these children. The absence of a creative solution to this problem will continue to perpetuate generations of children whose education begins and ends with the daily economic activities they perform.

Ghana is a country that has several rural regions where children are likely to give up education to participate in income generating activities for their families. Ghanaian children begin working as early as age 5 in rural Ghana (Canagarajah & Coulombe, P.9). A study of Ghanaian children between the ages of 7 and 14 found that approximately 60% of Ghanaian children attend school, but only 19% of children who officially reported to be working attend school. This data indicates that 81% of working children in Ghana do not receive any form of education. Furthermore, children of Ghana's rural areas are significantly more likely to replace education with work than children of its urban areas.

### **Solution**

Our solution is to test a pilot program that will enable us to test and measure the effectiveness of our proposed educational gaming station in a test area in Ghana. The focus of our solution is Educational Gaming Stations. Our stations, as backed by our research, will serve as an informal means of education to the community. Currently, the rural areas of Ghana, which are the areas of Ghana that have problems with education, are the prime areas that we feel our solution will be the most effective. Our pilot program would be measured over the course of 6 months to see



if it has an impact in the math grade level of kids that aren't able to go to school for one reason or another. We know that education can be an effective means of education, our program is designed to see how effective we can make it, and how many children we are able to target through this concept. We believe that there are a significant number of kids who don't go to school, and that children will make use of these educational gaming stations because they are motivated to have fun, and learn through another medium. We want to contact the Ghana government, and an outside game developer to work hand-in-hand with this project. We believe that working directly with the Ghana government, we can cater these stations, and our pilot station to the culture and needs of the Ghanaian community. In contacting an outside gaming developer, such as Microsoft, Electronic Arts, or BioWare, we can get the backing and a community of gaming developers to assist with the development process, in bringing high quality, high educational level games to these communities.

## **Outcomes**

We developed two proposals for our program as outcomes. These proposals are targeted at the Microsoft and MIT collaboration Games-to-Teach, and the Ghana government. They discuss our pilot program, what we plan to accomplish, and how we plan to accomplish it. In relation to our adjusted expected outcomes, they fall in line with what we expected. We wanted to develop some sort of system that we could develop a proposal for, and provide clear research that supports that our proposed system can be effective if used correctly. We did just that, we developed proposals for our pilot program of an educational gaming station that we hope to

implement in a community that has a great need for it. We are confident that educational gaming stations are the perfect substitute for the kids who are unable to get a formal education.

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