Report on The Reading Project

Children are the most precious natural resource of any nation. Their ability to read is one of the single most important skills for them to develop, if they are to thrive as individuals and global citizens. Literacy opens the mind of a child to a potential lifetime of learning, personal growth, and critical and creative thinking. The development of such forms of thought in a society fuels discovery, productivity, and innovation, which, in turn, drive economic growth and social development.

Nevertheless, millions of children never learn to read, a fact with consequences that are evident around the world. It is estimated that around 100 million children live in poor, remote areas where there is no access to schools and where everyone around them is illiterate. There are at least another 100 million children who live where schooling is so inadequate, that they too, fail to learn to read. Few of these children will ever become contributing citizens of our world.

We believe that this situation is unacceptable and can be changed. If we use the best scientific knowledge about how children learn to read with our new and evolving technological capacities, we can help children acquire literacy without being in schools. The implications would be extraordinary.

If children can learn to read on their own, UN Millennium goal #2, *universal primary education for all*, will be achieved far sooner than the time it will take to build schools and train teachers in sufficient numbers Accordingly, we are engaged in an18-month project to complete one of the most important experiments in learning currently underway anywhere in the world. The Reading Project represents a new approach to the global problem of illiteracy and the enormous loss of human potential it represents.

1. **The Problem**

Over 100 million children around the world have no access to school and another 100 million will attend some school but leave it without the ability to read.

2. **The Research Question**

Can children learn to read on their own using only tablets?

3. **Project Objective**

The objective is to determine if, within 18 months, children engage in “early reading,” as measured by the ability to decode first grade material. This will provide the basis for moving children from the "learning to read" period to a level where they are "reading to learn".

4. **Project Management**

The project is managed by OLPC, in collaboration with MIT, Tufts University, African Union, Georgia State University, and the Ethiopian Ministry of Education.

5. **Project Design**

The investigation is underway in two remote villages in Ethiopia. Ethiopia was chosen because it has pockets of illiteracy, the Ethiopian government is committed to solve this crisis, and OLPC has a good, working relationship with the Ethiopian government. In addition there are several schools in Ethiopia, which have been successful in implementing OLPC projects.

5.1 Technology

The project uses Motorola touchscreen tablets that are loaded with several hundred applications, books and movies. The Motorola tablets were chosen because of durability and cost effectiveness. The tablets operating system is completely customized by the OLPC team to conduct the research. Motorola tablets battery life is 6 hours with intensive use.

Since the villages do not have electricity, solar stations were constructed in two sites. The solar system can charge 20 tablets simultaneously. There is integrated solar controller to the station that solar data log is collected every week to check the tables are completely charged and used in a daily basis. The solar station doesn't purposely include the inverters to avoid any other devices to be plugged to the stations. This prevented misuse of the station for mobile phones and other devices it might be available in the community.

Selected individuals have been trained on how to run the stations, whereupon the tablets are dropped off to the village elders with no instruction on how to use them.

5.2 Data Collection

Once a week, the local representative goes into the village and swaps SD cards that have been capturing data throughout the week. Teams at Tufts, Georgia State and MIT then analyze the data.

5.2.1 What Kind of Data has been collected?

The data collector application installed in each tablets captured opening and closing of a single application on the tables, how long the kids open a certain application and what are the daily routines.

5.2.2 How Data Is Collected?

Each Motorola tablets support extended storage area – SD cards. The data automatically saved to the external SD cards. The team collects the SD cards every week, and place a new SD card into the tablets. The data size in each SD cards is from 20mb – 300mb depends the kids' activity. This data copied to a laptop and sent to MIT and Tufts for analyzing.

5.2.3 How to Analyze the data?

There are three main application developed by OLPC team, each application has an individual roles – app data collector, screen recorder and background data collector. The interactions between the kids and tablets can be summarized by these main activities. The interactions and the time frame show what the child has been opening and playing from the application menu. Since the applications, movies and books design to engage the users to interact, the data analyzing shows the progress collectively in each week.

5.3 Contents

The applications, books, movies, games and music installed on the tablets are most loved resources available from different sources. The Ethiopian KG-1, school preparation English courses are very similar to the content, which are installed to the tablets. The content strictly works with stage that it controls the speed of learning by unpacking advanced stages. This is has been a good practice on gaming technology that the next level is unlocked when the current stage is successfully passed. The contents unpacking difficult stages while the kids' advance. The time frame is important when it comes to content that the kids will not jump any important knowledge randomly, but rather take time to master it until the tablets unlock the next level. Other open materials, such as movies and music entertain the kids while they are learning. This open material motivates for kid to spend long time on tablets and always find a personal attachment with different characters and stories.

6. **Early Findings**

6.1 Learning

We have found to date that tablets are far more intuitive than laptops and provide the ideal device for self-learning and discovery. In the first village, the first child took four minutes to figure out how to turn the tablet on, and within the next three minutes all 20 of the children had learned to turn them on. After the first week, the children were using 47 applications per day.

In the weeks that followed, most of the children mastered the use of the tablets and have experimented with every application and activity on the tablet. Children have used the tablets on average six hours per day, collectively activating over 40,000 applications, books, and films. Several months into the experiment, some children are reciting the alphabet, many are learning various English words and writing letters, and a few have begun to match symbols with sounds. In one village, a child whom the OLPC team observed was "shunned" by other children is the one who mastered the tablet fastest and is serving as a "teacher" to the other children. His transformation has been extraordinary.

6.2 Physiological Effects

The kids, and the community at large excited that there is something new in the community where they can work on. The community appreciates the government's efforts to reach illiterate villages. They parents let the kids spend long time on the tablets and also learn how to read with the kids. This creates a great deal of excitement and sense of learning each other among the community.

One of the problems we faced running the project so far was, the kids spent a lot of times on the tablets and after the battery is drained and shut down they still want to turn on the tablets to work on. Even though, the eagerness and excitement is there, this made the tablets vulnerable for unexpected battery drainage. Please see the technical reports on problem we faced on running the project.

6.3 Solving Own Problems

The kids trying to learn something or pass a certain challenging stage on themselves than asking for help. At the early stage findings, we are able to notice that the kids are developing a sense of solving their own problems instead of relaying on aid. Unlike many other projects, this projects based on self-learning, self-discovery and self-standing approaches.

7. **Progress Report**

In many cases the kids advanced from their initial state when the tablets were handed over. Almost all the kids are able to associate the symbol of an alphabet to its sound and half of them could also exercise to write the alphabets. One of the kids in Wonchi be able to convert the sound of the word and writing it on

the tablets. The word was “lion”. We also discovered that most kids tired to write partial alphabet of a certain word with error margins. Most kinds know the word “Cat” starts with “C” instead of “K” which is common mistakes with minors.

The progresses of the kids are immense. The kids learn a lot new things every day with updated app installed on the tablets. They manage to track that there were a new app installed into the tablets and could manage to spot it without difficulties.

The operating system of the Motorola tablet is android. Even though, we tried to lock the camera the kids found out a way of hacking the android and discover different ways of working on the tablets where adults could also find it hard.

8. **The Team**

Over an 18-month period, OLPC will cover the design, implementation, and upkeep of tablets; data collection and analysis; and the evolving iteration of more refined tablets based on collected data. The following is the team for the reading Project.

Cynthia BREAZEAL: Associate Professor at the MIT Media Lab. World recognized technology innovator and researcher in human-technology interaction design with particular focus on young children and learning outcomes. The TinkrBook Project serves as a technological foundation for the learning platform and immersive environment her group will develop for this project, in addition to the walled garden platform for remote field science necessary to inform the design of this software.

Sugata MITRA: Professor of Educational Technology at the School of Education, Communication and Language Sciences at Newcastle University, UK. His famous “Hole in the Wall” experiments showed that children who have never seen a computer before in remote rural areas in India could learn computer literacy skills on their own. He is a pioneer in Minimally Invasive Education (MIE) and brings extensive experience in understanding how children engage with technology-based learning

experiences where there are no schools.

Robin MORRIS: Assistant Provost of Research, Georgia State University. He is one of the preeminent research methodologists in psychology and neuropsychology. His role is the external evaluator in this project.

Nicholas NEGROPONTE: Founder, Chairman Emeritus of the MIT Media Lab where he remains on the faculty. Also founder of the non-profit One Laptop Per Child (OLPC) that developed the $100 laptop. He brings extensive experience in developing and deploying personal computers to children in developing countries.

Maryanne WOLF: John DiBiaggio Professor of Citizenship and Public Service, Director, Center for Reading and Language Research, and Professor of Child Development at Tufts University. She is an expert in the origins of reading and language learning. She is best known for her research on reading intervention and her book *Proust and the Squid*: The Story and Science of the Reading Brain. She designed the RAVE-O curriculum for fluent comprehension in early readers.

Matthew KELLER: Director Of Europe, Middle East and Africa for One Laptop per Child (OLPC), and currently serves as Vice President for Global Advocacy. In these capacities he has worked with governments and international institutions in dozens of countries at every level in order to bring laptops to children living in some of the remote places on Earth. Mr. Keller has also worked as a senior program officer with the United Nations World Food Programme (WFP) in Rome, Italy, as Legislative Director for Common Cause in Washington, DC, as a lawyer and advocate on behalf of migrant farm workers in the Southwest United States, and as Jesuit Volunteer in Portland, Maine.

Markos LEMMA: ICT consultant and expert. He graduated with computer science from Royal Melbourne Institute of Technology (RMIT University) & Addis Ababa University and running and volunteering with many projects. He has been working on OLPC projects since 2007, he gave a technical support to the Engineering Capacity Building Program (ecbp) – a governmental program which was running by Ministry of Capacity Building and German Technical Cooperation (GTZ)

Michael GIRMA: Graduate of Helsinki University, Finland with Mobile programming and Computer Science from HiLCO University College. He is the project manager of the reading project. He has been working for ecbp from 2007 – 2009 and running eLearning projects on 7 governmental universities before he left to Finland to extend his studies.

9. Broader Implications

If we can prove our basic supposition that children can teach themselves to read at a first grade level without traditional instruction, we will have provided the basis for moving children from the "learning to read" period to a level where they are "reading to learn." If the project is successful, it will serve as an extraordinary demonstration to

governments and aid agencies world-wide of the power of tablet-based learning as a way to reach the world's poorest, most marginalized children, living in the most remote places on Earth.