A Short Case Study of the Impacts of the OLPC Project around the World

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Abstract: The ambitious One Laptop per Child (OLPC) Program was launched in 2005 and has distributed over 2 million rugged, low power connected laptops to some of the poorest children in the world. The chairman and founder, Nicholas Negroponte, is pioneering an experiment with the OLPC project which could fundamentally alter the dynamics of education in the developing world by bringing literacy, learning and connectivity to the estimated 100 million children who currently do not receive education at a first grade level. In this paper we performed a case study using existing literature where we looked into the situation in six countries. In three of these countries the OLPC project was considered successful and in the other three countries the project did not necessarily live up to the expectations. We explored the factors which lead to the success of the OLPC project in these countries and then we looked into the factors that lead to the inadequate results in some of the other countries.

Keywords: One Laptop per Child, Case Study

1. INTRODUCTION (Ilia)

Most of the nearly two–billion children in the developing world [1][3] are educated, ineffectively or receive no education at all. One in three children does not complete the fifth grade [1]. These children live in poverty and isolation just like their parents and never know what the light of learning could mean in their lives. At the same time on one hand, the governments of the developing countries struggle to compete in a rapidly evolving global information economy and on the other hand they stumble by a vast and increasingly urban underclass that cannot support itself, much less contribute to the commonwealth because it lacks the tools to do so [1][2]. Hence, the idea of the One Laptop per Child (OLPC) project is to allow children of the developing countries to educate themselves by providing one connected laptop to every school-age child. OLPC's aim is to make education for the world's children a priority and not a privilege. With the tagline, "It's not a laptop project. It's an education project," the One Laptop per Child initiative aims to revolutionize how we educate the world's children [3].

In this research we present six case studies that looked into the impact of the OLPC project in various countries. More specifically, we looked into three countries where the project was a success and three countries where the project did not live up to its expectations. In the last stages of this paper we discuss what factors lead to the success or failure of the OLPC project in the countries.

2. BACKGROUND (Sonika)

In January 2005, the MIT Media Lab and its founder and chairman Nicholas Negroponte launched the research initiative to develop a $100 laptop, which then lead to the development of the One Laptop per Child association [3]. Many developing countries have inadequate resources to devote to education. According to OLPC, some countries spend less than $20 per year per child (compared to an average of $7,500 in the United States) [1][3]. By giving children their very own connected laptop, OLPC hopes to give them a window to the outside world with access to vast amounts of information and a way to connect with each other [3].

The XO laptop, which is what the laptop designed for the OLPC project was called, was designed and created for the use of children between the ages of 6 to 12 who still attend the elementary school [1]. OLPC created the XO laptop to be very low cost, robust and

powerful. However, three unique conditions had to be met; low power, sunlight readability, and automatic connectivity. Since these laptops were going to be deployed in developing countries, low power was the key because most children do not have electricity at home. Therefore, the laptop needed to run on both human power and long-life batteries. Sunlight-readable displays were important for outdoor use as well as power conservation. Lastly, connectivity could not assume DSL, WiFi hotspots, or anything similar. Instead, the laptops collectively had to make a network automatically, without a child or teacher intervention. That way roughly 500 children should be able to share a single point of back haul to the Internet [4].

Since its launch in 2005, the ambitious One Laptop per Child Program has distributed over 2 million rugged, low power, connected laptops to some of the poorest children in the world [1][4]. Figure 1 shows a map of the areas where the XO laptops have been deployed until now.

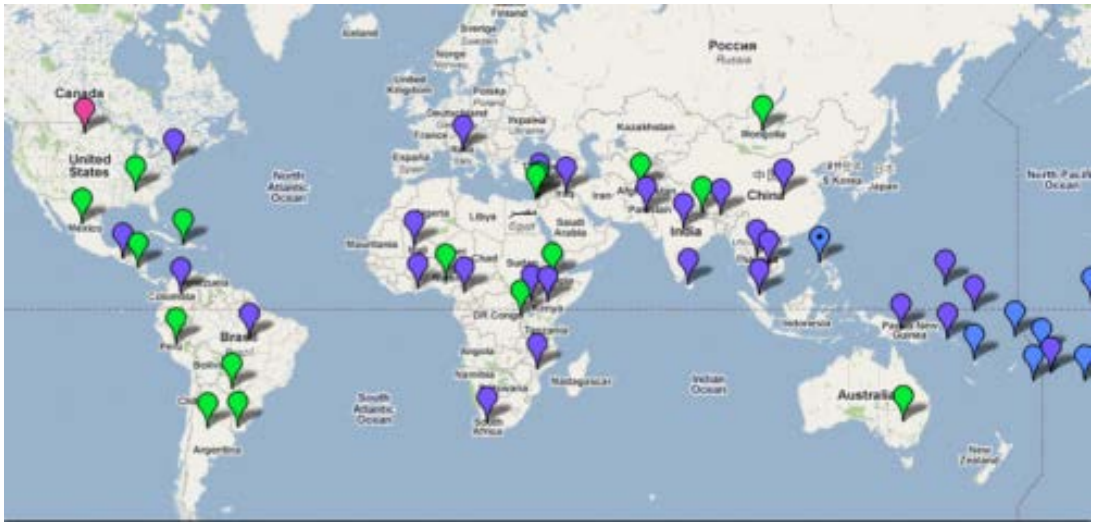

Figure 1: The current global distribution of XO laptops across the world [10]

The OLPC foundation states five core principles [5]:

i. children are the owners of the laptops
ii. beneficiary children are aged 6 to 12
iii. every child and teacher receives a laptop
iv. children are connected through a local network or the Internet, and
v. software is open source and free.

From the stated mission and five principles, the underlying vision was that students will improve their education by using the laptop and through collaboration with their peers. However, Cristia et al's. research looked into random schools where children had the XO laptop and found that the laptops resulted in substantial increase in computer use both at school and at home. Their results indicated limited effects on academic achievement but positive impacts on cognitive skills and competences related to computer use. Cognitive abilities could have arisen through using the programs included in the laptops, given that they are aimed at improving thinking processes. However, the authors indicated that to improve learning in math and language, there is a need for high-quality instruction [6].

For further investigation we looked into three countries where the OLPC project was successful and also three countries where the project could not meet its goals. These findings will be presented in the following two sections.

3. OLPC PROJECT SUCCESS (Sonika)

The OLPC project had its successes and failures. This section will look into three countries where the project had positive outcomes. Specifically, we will look at the factors that lead to the successful deployment.

3.1. Case Study 1: Uruguay

The one-laptop-per-child (1:1) model was first implemented in 2007, and it was quickly disseminated throughout the Uruguay. Plan CEIBAL (Conectividad Educativa de Informática Básica para e Aprendizaje en Línea), which began in 2007, also fell within the 1:1 model. In fact, it was the world's first experience with such a project on a nationwide scale. Plan CEIBAL was implemented at the request of the then President of Uruguay, Tabaré Vázquez. It was planned as a measure against the existing inequalities regarding access to ICTs, and to that end, it was presented as a project for social inclusion [7]. The main purpose of the plan was, and remains, to attain equality in access to information through the distribution of laptops and the provision of Internet connectivity services to all the schools and districts in the country. Such services are accessed through the distributed XO laptops, which have been designed especially for the needs of children [8]. They have basic operating features that enable them to work in different environments as classrooms, homes, or even public places. This, in turn, offers a number of possibilities for teaching purposes. The project intends to have a major social impact on the relationship between the school and the family, promoting the abilities needed to succeed in a 21st century society across the whole length of a child's life in an attempt to bridge the existing digital divide [7]. As a starting point, Plan CEIBAL distributed one laptop to each child in first through sixth grade attending a public primary school in Uruguay, as well as to the children's teachers. The plan was first implemented during the first half of 2007 [7] [8]. The distribution of laptops to all public schools in Uruguay was conducted in four phases and completed by the end of 2009.

In 2010, the plan went on to include secondary schools. The XO laptops had internet connectivity and video camera with audio, and they also included educational software. Furthermore, the local developers introduced some applications to improve the laptops' internet connection, hardware, and software. By 2011, more than 500,000 [7] laptops had been distributed and several activities and complementary projects had also been implemented, which shows that Plan CEIBAL was not merely a policy aiming at narrowing the digital divide in terms of computers and the Internet. Three educational portals were created, as well as a pedagogical project. Training courses were delivered to more than 20,000 [7] teachers and over 500 support and catalyst teachers had been hired [8].

Additionally, the plan provided all public educational centers and certain public places with Internet connection services. Today, almost every child who attends a public school has a wireless Internet connection. Access to the Internet at home is possible to the extent that the home is located near an educational center or a public place with the required infrastructure. One essential purpose of the plan is to provide wireless connectivity to households so that anyone desiring to access the Internet will be able to do so without walking more than 300 meters from his or her home. However, this goal has not been fully accomplished yet [8]. "It's been a revolution, which has helped us enormously, but it hasn't been easy," [8] explained Lourdes Bardino, head teacher of School 173 in Las Piedras. Ms Bardino said that some teachers were originally opposed to the introduction of the XO laptops. "We have a lady who's been teaching for 30 years and when they gave us the computers and the training, she asked for leave because she didn't want to have anything to do with the programme. Later she changed her mind and now computers have changed the way she teaches [8]." All the teachers have been given training, but the extent to which they use the laptops in the classroom is up to them.

Overall, according to Prusa and Plotts, Plan CEIBAL has incredible potential in terms of both its educational and social impacts in Uruguay. Much of its success will depend on how Plan CEIBAL addresses known challenges and continues to evaluate the program. There are real challenges in streamlining the repair process for XO laptops, or ensuring teachers feel comfortable using the XO in class [9]. On a systemic level Uruguay needs to follow through with its intention to fundamentally reform the education system; the laptops are a small but symbolic part of this reform. The laptops alone are not going to solve everything. Nevertheless, the strong dedication to making Plan CEIBAL work which was demonstrated by government officials, teachers and school administrators

alike gives Plan CEIBAL and the OLPC project an advantage of moving forward [9].

3.2. Case Study 2: Nigeria

The OLPC association behind the $100 laptop has formed a partnership with multiple African governments through which it hopes to deliver laptops to every primary school child in East Africa. The partnership between One Laptop per Child (OLPC) and the East African Community (EAC) aims to deliver 30 million laptops in the region by 2015. OLPC has also announced a partnership with a UN agency which aims to deliver 500,000 machines in the Middle East. Both the UN agency and the EAC first need to raise money for the laptops. The two groups aim to find donors to help pay for the machines, which currently sell for more than $200, despite intentions to sell them for less [13].

A good example of a successful OLPC project deployment is Nigeria. As Jonathan Fildes of the BBC reports, until the XO laptops were deployed there was nothing that marked out Galadima primary school as anything out of the ordinary. The government-run school, flanked by a red dust road on the outskirts of Abuja, Nigeria, taught about 300 students who congregated from the surrounding rural area.

In March of 2007 the scruffy primary became part of a remarkable experiment. It was the first in Africa to get its hands on the XO laptop that aimed to allow the children get the most from their education. The tough machines were designed to be an addition and to some extent replace battered text books and traditional teaching. The school was given around 300 of the low-cost laptops along with a satellite internet link (VSAT), a power generator and solar panels. The idea was to see if the machines would survive the ultimate test: children [13][14]. "We wanted to bring the laptops to an environment where the kids would drop it, put it in water and do everything you wouldn't want to do to a normal laptop," explained Ayo Kusamotu, a lawyer and volunteer with OLPC Nigeria, which is an independent group set-up to support OLPC in Nigeria [14]. The hardware trial ran for five months. "We've actually learned a lot from that trial - really simple things that are almost mundane but important" explained Walter Bender of OLPC [14]. "For example, some of the desks in Galadima are at an angle and we learned that you've got to put rubber feet on the laptop otherwise it will slide off. So now production laptops have rubber feet. [14]"

The trial has ended and OLPC Nigeria has continued to fund and support the school's use of the laptops. Jonathan Fildes mentions that it remains one of just a handful of places in the world where the OLPC vision can be seen "in the wild" and visiting it is an uplifting experience [14].

Additionally, the children most of who had never seen a computer before March 2007 had clearly embraced the XO laptops. As Jonathan Fildes continues to report, “Even before entering the school grounds, visitors are accosted by hordes of animated children waving their laptops, eager to show what they can do with them. Children stream from doorways and alleys wanting to take a "snap" with the laptop's on board camera whilst others shoot video files and then excitedly show each other the results. The more studious show off the graphs and pictures they have drawn and the notes they have typed in class. There is a clear sense of enjoyment and pride in both ownership and use of the machines” [14]. The XO laptops were one of the happiest things that had happened to the school. As one teacher mentioned, before the laptops arrived, the school did not feel as if they were important. The laptops gave them the feeling that they were moving ahead. The laptops raised the status of the school and also improved learning at school and the surrounding community [13]. The laptops made it easier for the teachers to give assignments and notes so the children could learn faster. The machines were not only used at school but also at home where they children taught their parents to use the laptop as well. Just like in Uruguay, both teachers and the children were given trainings on how to use the XO laptops and also in the curriculum surrounding it [14]. The laptops were used to augment the text books and black boards rather than replace them and it became a success.

3.3. Case Study 3: Solomon Islands

Trials started at Batuna, Patukae and Sombiro in Solomon Islands, in July 2008. In March

2009 three trials schools were given 300 laptops. In April 2010 the Solomon Star News [11] reported that the One Laptop per Child project made positive impact on the children. The information was taken from the Ministry of Education and Human Resources Development where the evaluation indicated that the impact of the OLPC programme was “very positive” [11]. As a grade 3 student at Sombiro Primary school in Marovo puts it: “I use the laptop to help me learn more things” [1][11]. The Australian Council for Educational Research (ACER) was commissioned by the ministry to undertake an evaluation of the OLPC trial in three schools in Marovo Lagoon. Solomon Islands was the first country which designed an evaluation framework for the OLPC in the Pacific Region. An evaluation was considered very important in order to take well informed decisions about expansion of the project, the approach, its sustainability and the financial and technical support. The key objectives of the framework relate to raising awareness about the project and assessing impact in a range of areas [11].

In 2005, Norwegian Professor Edvard Hviding published an unprecedented work: Reef and Rainforest: An Environmental Encyclopedia of the Marovo Lagoon. First arriving in Marovo in 1986, Hviding who is a dedicated pedagogue made sure that his work was not only available in the indigenous Marovo language, but that it aligned with the national curriculum, and came complete with teachers' guides and lesson plans. Now the XO laptops in the region are being used to bring a new dimension to this incredible resource. Solomon Islands Government is working with UNESCO to enable the kids of Marovo to use their XO laptops to access and update the encyclopaedia via a wiki platform [1, 12].

The project is unique in its approach in the Pacific, making an exceptional resource not just available to remote rural schools but also open to their contributions via the XO laptop and the Wiki, accessed through VSAT internet access. "The project demonstrates how technology can be used in poor rural communities to foster and protect indigenous knowledge as a living and dynamic resource owned by the communities themselves," says ICT for education expert, David Leeming, who is managing the project [12]. Mr Leeming cites the project as an effective use of Open Educational Resources (OER), an approach which he says is suitable for boosting the learning systems of poor and disadvantaged communities across the Pacific. "This can work wherever there is a demand for quality education that reinforces vernacular languages and local content [12]."

4. OLPC PROJECT’S INADEQUATE SUCCESS (Ilia)

In the previous section we discussed three countries where the OLPC project was successful. However, in other parts of the world the project seemed to have missed its mark as we will show in the next three case studies.

4.1. Case Study 4: Peru

Peru is enjoying an economic boom, but has one of Latin America's worst education systems. Flush with mining revenues, the previous government embraced the XO laptop initiative. It spent US$225 million to supply and support 850,000 basic XO laptops to schools throughout the country. But Peruvians' test scores remain dismal. According to the education ministry’s report, only 13% of seven-year-olds were at the required level in maths and only 30% in reading [16].

Peru's distribution of more than 850,000 XO laptops to children across the country easily ranks as one of the world's most ambitious efforts to use digital technology in the fight against poverty. However, almost six years into the program there are still serious doubts about whether the largest single deployment in the One Laptop Per Child initiative was worth the more than US$225 million that Peru's government spent [15]. The issue is not with the laptops. Instead it was about the mal-prepared rural teachers who were often unable to gage, much less teach with the machines along with software bugs not getting fixed and most could not be connected to the internet. Many could not take the computers home as the initiative intended. And some schools even lacked electricity to keep them running [15]. Basically, the laptops were delivered but the teacher were neither trained nor prepared to use the laptops in their curriculum.

A study from the Inter-American Development Bank spent 15 months examining the use of OLPC computers in 319 Peruvian schools that received the XO laptops, and found that Peru's substantial investment in the OLPC program has dramatically improved students' access to computers. The study found just 0.12 laptops per student in schools outside the OLPC program and within the OLPC program the ratio was 1.18 computers per child [17]. The study also found indications that the laptops improved students' skills. Being part of the OLPC program advanced verbal fluency and cognitive skills to five to six months ahead of the students outside the program. Nonetheless, the study was sharply critical of Peru's OLPC project as a whole, finding no evidence the program increased learning in math or language, and concluding "there is little solid evidence regarding the effectiveness of this program [17]."

According to Duncan [17], the factor that may have dampened the possible impact of the OLPC program on Peru's school systems was teachers' proficiency with the systems. The teachers should have received 40 hours of OLPC training, but that barely made a dent in schools where teachers may never have set hands on a computer themselves, or be responsible for simultaneously teaching children of all ages. In many locations, children were not allowed to take the laptops home (OLPC strongly recommends each student have an individual laptop), and in some cases parents or others tried to sell children's laptops Internet access which was also a major issue. Less than one percent of schools examined in the Inter-American Development Bank study had Internet access. Meanwhile, in upper grades and areas with Internet access, the laptops were mostly used for social purposes, including games and Facebook, rather than academics [17].

4.2. Case Study 5: India

On one hand the XO laptops were appropriate for certain countries around the world as discussed in section 3 but for other countries this was not the case. India is such an example. In 2006 India decided against getting involved in Nicholas Negroponte's One Laptop per Child project. The Indian Ministry of Education dismissed the laptop as "pedagogically suspect" [18]. Education Secretary Sudeep Banerjee said: "We cannot visualise a situation for decades when we can go beyond the pilot stage. We need classrooms and teachers more urgently than fancy tools. [18]" Banerjee said if money were available it would be better spent on existing education plans. Banerjee told *the Hindu*: "We do not think that the idea of Prof. Negroponte is mature enough to be taken seriously at this stage and no major country is presently following this. Even inside America, there is not much enthusiasm about this. [18]"

India is a good example that shows that even though something is technically marvellous does not imply that it is appropriate for a specific purpose or under special circumstances. The XO laptops are inappropriate for India as it would be a mistake for India to spend its limited public funds available for education in buying the XO laptops. Currently, the school-going cohort is around 200 million going strong. India has around a million schools, a few thousand colleges and universities. Over 90 percent of children drop out of school by the 12th grade. Public spending in education is in the low single-digit percentages [19]. A depressingly large percentage of schools are so cash-strapped that they do not even have a blackboard. The most important fact is that India's financial resource constrained. India cannot afford the XO laptops for roughly 100 million children who cannot afford to buy a laptop, regardless of whether it costs $400 (a well-equipped Dell) or $100 (the XO) [18, 19]. Giving the XO laptops to only a fraction of the children in such a huge population would be a disaster in terms of privileging some at the expense of the others. It may bridge the much talked about 'digital divide' for some but leave the rest worse off because they will not get even what little they were getting before. It is like feeding some cake and starving the rest, instead of distributing plain bread to all [19]. Finally, India has its own low cost laptop Aakash which cost $35 and is subsidised by the government [20]. Hence, if India wishes to distribute low cost laptops to the school children they would take the Aakash laptops and not the XO laptops.

4.3. Case Study 6: Ethiopia

Reports in 2009 [21] showed that the XO laptops were seen as a toy, not a tool that would play an important role in the children's education. Teachers did not like them enough and banned them from the classroom and parents discouraged their use at home, thinking the laptops were taking away from study time. The Ethiopian school system is designed around rote memorization where the teacher copies material to the board and students write it down in notebooks. If the students do not memorize to pass the national exam, they will not progress in the Ethiopian educational system, no matter their abilities with E-toys or Browse. Even though they might be smarter in a Western sense, relative to their own culture, they will be failures. [21].

The Ethiopian education model is very teacher-centric. Teachers should have all the knowledge, and students, by cultural definition are there to listen, not to question, and will not be as smart as teachers until they have passed the national exam [21]. Additionally, XO laptops were added this rigid system without extensive teacher training or tight integration into the national curriculum [21]. So as the students progressed past the teachers in computing acumen, the teachers quickly felt threatened by this technology, and unable to control it, felt undermined by it, especially in the classroom [21][22]. Students began to explore the machines' capabilities, undermining the teachers' lessons. This tendency painted the laptops in a very negative light for parents and teachers, who saw the machines as more of toys than study facilitators, although this may be in part due to the introduction of educational technology to a society more acclimated to traditional teaching methods [22]. Although the laptops do provide children with the chance to improve their e-literacy in a country largely devoid of technology, these advances will go largely unnoticed by academic evaluations because the national exam tests students on their ability to memorize the information presented in class. Beyond the obvious flaws of the OLPC program's deployment plan, Ethiopia demonstrates how societal problems can compound the project's essential problems [22].

Report from an OLPC critic working in the Ethiopian government mentions that the OLPC will ultimately hamper the development of Ethiopia [25]. To some extent we agree with this report. Ethiopia is one of the poorest countries in the world in which most schools lack basic sanitation and textbooks. The GDP per capita in Ethiopia is about $470[1] meaning that even a $100 laptop would not be affordable to anyone. OLPC proposed to give a highly expensive piece of equipment to a country in which the majority of the population are subsistence farmers. In addition to the teachers not accepting the laptop in the classrooms, concerns regarding security (the laptop being stolen or children attacked on the way to school), the lack of skills and equipment to fix the laptops and the extent to which the technology will be used also makes the deployment of the laptops in Ethiopia questionable. As mentioned in the critic's report the Ethiopian "children have more pressing needs such as whether they are going to be able to go to school at all and if they will have enough food to eat. The scarce resources that the Ethiopian Government and the donors have at their disposal should be channelled towards these pressing needs and not OLPC. [25]".

5. DISCUSSION AND CONCLUSION (Sonika and Ilia)

In this paper we looked into three countries where the OLPC project is considered as successful and also at three countries where the project was not as successful as the others. Different factors contributed to the success or failure of the project. As a recap, One Laptop per Child was a good idea that was proposed by Nicholas Negroponte in 2005. It was a noble and ambitious idea. OLPC aimed to build an inexpensive laptop that would be sold to governments in the developing world and made available in turn to the children in those countries via their respective ministries of education. But as we found from the six case studies in this paper, such a project is easier said than done. Over the course of the past seven years, the OLPC has fussed with hardware and software specs, finally building a

[1] Data taken form World Bank: http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries/ET?display=graph

laptop that costs $200 which was twice that of the originally promised price [23].

However, what needs to be taken into account is the fact that a large portion of the developing world has experienced its own mobile computing revolution. This means that there are a number of manufacturers who are working on low-cost devices for the market in the developing countries. For example, the Intel Classmates PC has similar hardware, but more expensive software than its XO laptop. Another example would be the Worldreader project which delivers villages a library full of e-books via Kindles. Lastly, there is the Aakash tablet which was sold in India for $35.

On the other hand, not only does OLPC face competition from the low cost tablets and netbooks but also from the cell phone industry. Nearly 95% [23] of the world's population owns a cell phone. Agreed that a cell phone is no comparison to the XO laptops but the ubiquity of the cell phones makes it clear that the value proposition of the OLPC device needs to be more than just "access" and "connectivity" [23]. The mission of the OLPC project was:

"[To] *aim to provide each child with a rugged, low-cost, low-power, connected laptop. To this end, we have designed hardware, content and software for collaborative, joyful, and self-empowered learning. With access to this type of tool, children are engaged in their own education, and learn, share, and create together. They become connected to each other, to the world and to a brighter future."*[1][2][23]

The mission statement does not mention anything about improving standardized test scores or student achievement, yet most of the critics measured the success of the project exactly through those two aspects. The success should have been evaluated through the passion for learning and the ability to learn how to learn for the children and not their test scores. This is considered as one of the limitations of our paper. It was very challenging to find literature that evaluated the project without the test scores or student achievements. Standardized test scores in math and in language do not reflect "the ability to learn how to learn." Lastly, training the teachers is always an issue. Just parachuting technology in to a classroom and expect everyone to just pick it up, understand it, use it, hack it, and prosper does not work. Teachers need training to be able to use and integrate the technology in their curriculum [23].

The OLPC project is a very western technological solution. We agree that the OLPC represents a desire to support literacy, connectivity and learning through technology. But it does those things in a world of ubiquitous cell phones, which on their own have not transformed the education either [23]. The OLPC tries to be non-invasive but even then it ended up not getting support from the teachers and children. Ethiopia is such an example. But that does not necessarily make the project a failure. The measurements of success done by for example the World Bank could be considered political and not necessarily pedagogical. These scores show us less about the global reach or potential of technology, and more about the dominant narratives of the U.S. education system by asking questions like "what counts" as learning which in the US system is nothing other than the standardized tests [23]. So it is unfair to evaluate the OLPC in the same way because it goes completely against the mission of the project.

At the same time the project does need to improve on its deployment plan. Firstly, OLPC's stated mission was "to ensure that all school-aged children in the developing world are able to engage effectively with their own personal laptop that is networked to the world, so that they, their families and their communities can openly learn and learn about learning [1]." But as our case studies with Peru and Ethiopia showed, more laptops per child does not mean more progress. Also, the assumptions of the project that infrastructure and educational systems would be comparable everywhere all at once does not work at all. A given technology does not lead to the same outcome, no matter where it is introduced, how it is introduced, or when as shown in figure 2 in the appendix. As Cohen [24] mentioned, "the outcomes, on this impoverished view of the relationship between technology and society, are predetermined by the physical technology which also assumes that what one means by "technology" is only the physical hunk of material sitting there, as opposed to including its constitutive organizational, values, and knowledge elements [24]". The

OLPC project assumed equal global cultural values and regional attributes which is one of the main reasons why the project did not live up to its expectations in Ethiopia. Additionally, the project also assumed common introduction, maintenance, learning styles and habits, and image values everywhere in the world which caused major problems for the project. Cohen also pointed out that the project "lives in a historical vacuum assuming that there is no history in the so-called "developing world" for shiny, fancy things from the West dropped in, The-Gods-Must-Be-Crazy style, from the sky [24]". It is not possible for the same laptop to have the same meaning and value in Uruguay, Nigeria, Solomon Islands, Peru, India and Ethiopia. The six case studies that we have taken into consideration in this paper show how the values and meaning of the XO laptop differ from one country to another and as a result the outcome of the project varies as well.

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7. APPENDIX

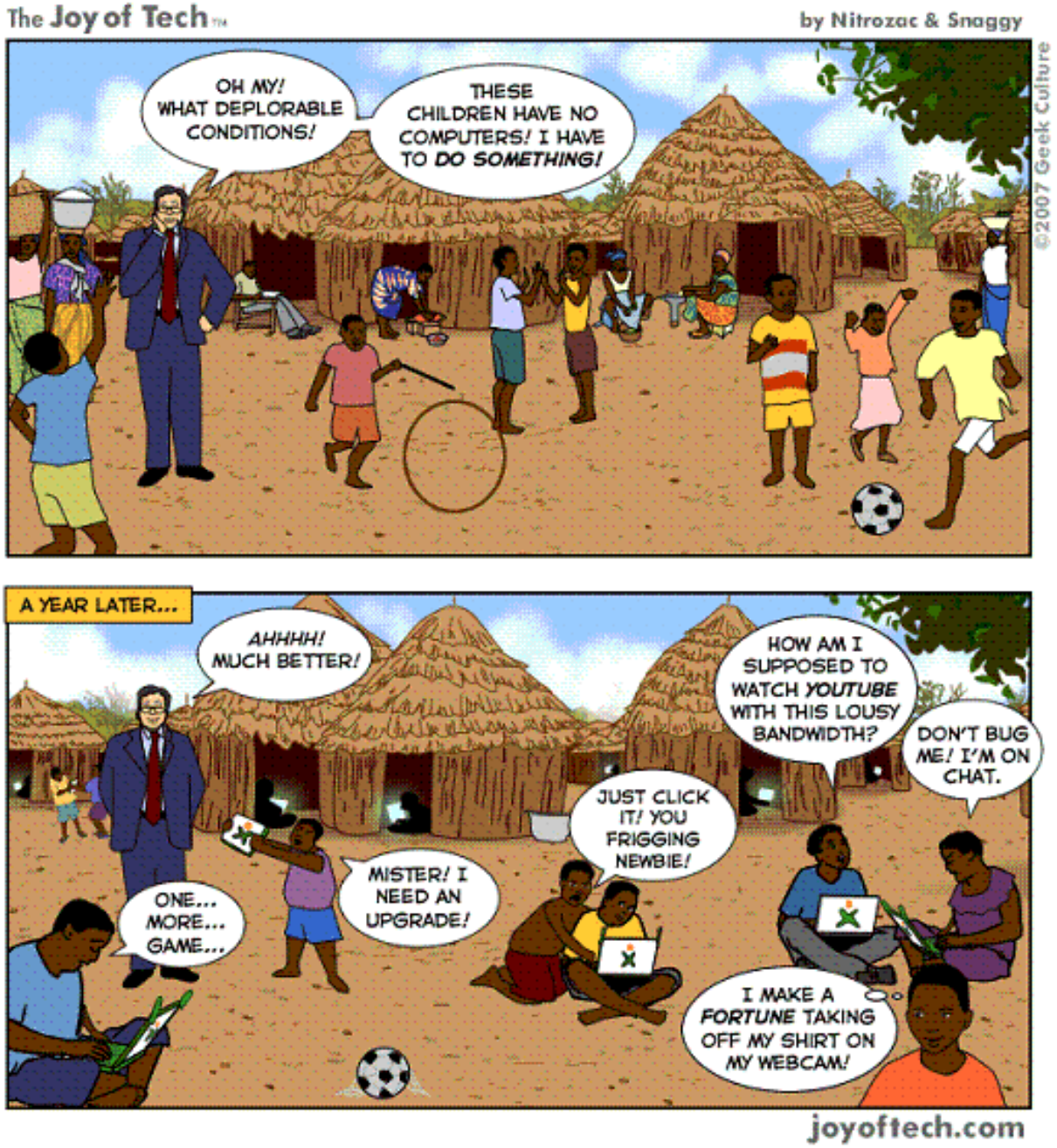

Figure 2: Different Values and Meaning of XO Laptops in Different Cultures [24]