Classmate PC and OLPC
Education project Vs. Laptop project

María Catalina Payán
Master student in Digital Media
Hochschule Bremerhaven
catapayan@gmail.com

ABSTRACT

This paper describes the problem of computing technology marginalization in the developing countries, the participation gap and the different projects that have been created in order to solve the marginalization problem. By exploring two projects: the Classmate PC and the OLPC, their learning theories, educational goals and the technical differences between them this paper will determinate which one is an education-oriented project and which one is a laptop- sales oriented project.

Keywords

Marginalization, developing countries, new world skills, laptop project, education project, educational theories, OLPC, Classmate PC, constructionism, participation gap.

INTRODUCTION

Societies are being shaped by globalization which makes information available worldwide, especially through computing technology. By spreading information technologies, this digital globalization is helping the world speak and understand the same language; therefore the awareness of this digital globalization should become a major concern.

This paper will describe the problem of computing technology marginalization in the developing countries, starting from the participation gap and the new skills young people must have in order to get involved in the collaborative networking. As a result of this participation gap, different projects that address the digital marginalization problem have been formulated. This paper will explore two of them in depth: the Classmate PC and the One Laptop per Child (OLPC) project, getting more in touch with the learning theories and educational goals such as "Pedagogy of the oppressed" and "Constructionism". The paper will also compare the two projects technically and will explain the differences between an Education project and a Laptop project.

PARTICIPATION GAP PROBLEM

The needs and conditions of the developing countries vary drastically compared to the developed ones, and this marginalization affects mostly young people as they cannot build up the necessary skills to confront the 21st century and compete with the youth of the developed ones.

Recent studies [2] have shown that one half of all teenagers in the USA have already created media content and one third of the internet users have shared the content they produced; these teens are involved in participatory cultures. On the other hand, if we take a closer look at the statistics, just 10.9% of the Latin-American population uses the internet [3]. This is a major concern because many countries in Latin-America, along with the other developing countries around the world, are having what is called the participation gap, which means an unequal access to the opportunities, experiences, and skills necessary for full participation of the youth in the world of tomorrow. Standardized tests have been done among 15-year-olds in 47 countries around the world, and the results were not encouraging for the Latin-American countries: Argentina, Brazil, Chile, Mexico, and Peru are at the bottom of the heap in reading comprehension and math [4]. In order to overcome this gap pedagogical suggestions have been made: one new way of learning involves social skills that can be developed through collaboration and networking.

According to Henry Jenkins, the director of the comparative media studies program at the Massachusetts Institute of Technology, among these new skills we can find:

- The capacity to experiment with one's surroundings as a form of problem-solving.
- The ability to adopt alternative identities for the purpose of improvisation and discovery.
- The ability to interpret and construct dynamic models of real-world processes.
- The ability to meaningfully sample and remix media content.
- The ability to interact meaningfully with tools that expand mental capacities.

- The ability to pool knowledge and compare notes with others toward a common goal.
- The ability to evaluate the reliability and credibility of different information sources.
- The ability to follow the flow of stories and information across multiple modalities.
- The ability to search for, synthesize, and disseminate information.
- The ability to travel across diverse communities, discerning and respecting multiple perspectives [2].

These types of skills can be easily seen in teenagers that have been surrounded by technology since they were born. Unfortunately teenagers in developing countries do not have the same opportunities and therefore they have not developed such skills which are crucial to cope with the 21st century. UNESCO estimates that only 5% of the world's 1 billion children from primary and secondary schools currently have access to PCs [10]. That is why campaigns like OLPC and Classmate PC were organized.

CLASSMATE PC

"Intel-powered classmate PCs are purpose-built netbooks designed specifically to meet the educational needs of young students and create new possibilities"[12]. The Classmate PC, known before as Eduwise, is Intel's answer to the low-cost computer market for children in the developing countries. The Classmate PC is considered an information and communication technologies for development project and the device is part of the new category called netbooks; the Classmate PC netbooks are based on the Intel processors and architecture.

Classmate PC aims to enrich the learning experience through interactivity by providing access to the Web and digital content. A Classmate PC helps facilitate group and project-based learning, encouraging collaboration with peers and teachers. Students can create rich and interactive digital content as part of their learning process. The teachers can administer the class tests, manage computer-induced distractions, share rich-media content, and provide feedback on student performance. It also helps parents stay closely involved in their child's education by accessing feedback from teachers and facilitating parent-teacher communication [12].

The Classmate PC intends to provide technology that fits, primarily in a Windows-based computing environment. The idea is for the users to learn about the technologies that currently dominate today's world. Classmate PC runs Microsoft Windows or Mandriva / Metasys - Linux.

Among the advantages of the Classmate PC we can find its small form, its rugged design for students, a teacher console unit, and an integrated software management solution.

ONE LAPTOP PER CHILD (OLPC)

The OLPC is a U.S. non-profit organization with a social vision: "To create educational opportunities for the world's poorest children by providing each child with a rugged, low-cost, low-power, connected laptop with content and software designed for collaborative, joyful, self-empowered learning" [9]. The organization believes the laptops must be much more than electronic substitutes for textbooks, their objective must affect learning deeply.

OLPC objectives are bound to the pedagogical theory of Paolo Freire, a Brazilian educator and influential theorist of critical pedagogy, "Pedagogy of the Oppressed" is based on the idea that oppression and domination can only be solved by those who are oppressed and dominated [13]. This means that it is not by giving them rice that we are going to feed the hungry; the answer is teaching them how to grow their own product.

Pedagogy of the oppressed

In Freire's theory, the individual learns to seed his own support through situations from his daily life, providing him with useful learning experiences. These learning experiences happen when the individual analyzes the world in which he lives - not by adapting himself to this world, but as an effort to change it and to make it suitable for his historical demands. Freire's theory proposed two different moments: the first is when the individual becomes conscious of the reality where he is living as the oppressed, being subject to the decisions that the oppressors impose; the second is the initiative of the oppressed to emancipate themselves from the oppressors [11].

Constructionism

The OLPC has based its educational philosophy on the theories of Seymour Papert, a Media Lab professor who pioneered the use of computers in elementary education. He developed a theory called Constructionism [1], which explains that young children learn best by doing instead of being lectured to. The learning development occurs when they are involved in a public, guided, collaborative process that includes feedback from peers, not just from teachers. As a result of this philosophy, OLPC designed the machine and its software to enable collaboration, exploration, and experimentation rather than rote lessons and e-books.

The other difference of the OLPC from the Classmate PC netbook is that instead of using Microsoft's Windows and ready-made commercial applications, the OLPC chose the Linux open-source operating system, creating a new user interface and applications. These applications are designed specifically to support learning by doing.

OLPC and its XO-1 device have five principles [6]:
Child Ownership: A connected laptop is more than a tool. It is a new human environment of a digital kind. A key

OLPC asset is the free use of the laptop at home; the idea is that the children will own the laptop. This allows children to influence, teach and help their mothers, fathers and grandparents.

Low Ages: The XO is designed children of ages 6 to 12. They do not need to write or read in order to play and the digital activities will help them in the purchase of the writing and reading skills. Every year a new level will be incorporated into the program, and every student will keep an individual portfolio or journal.

Saturation: In order to reach a "digital saturation" it is important to choose the best scale: it can be a whole country, a region, a municipality or a village, where every child will own a laptop.

Connection: The XO has been designed to provide wireless network available everywhere. If one laptop is connected to the Internet, the others will also get access to the web.

Free and Open Source: The children must be active participants in the learning community not only passive consumers of knowledge. Therefore as they grow the software, content, resources, and tools should be able to grow with them. In the context of the constructionist learning, knowledge must be appropriated in order to be used and free in order to support the human need to express and share.

The design of the XO-1

It has a "child friendly" interface and hardware (indestructible); it can be charged in sunlight, and at night; it has low power technology, so it works in areas where no electricity is available; it also uses flash memory instead of a hard drive, runs a Fedora-based operating system (open-source); uses the Sugar user interface, and its Mobile ad-hoc networking via 802.11s, its Wireless mesh network protocol allows students to collaborate on activities and to share Internet access from one connection. The netbook has also been designed to be low cost and more durable than typical laptops [13].

OLPC Vs. CLASSMATE PC

Operating systems and software comparison:

Classmate PC

The Classmate is licensed as follows [12]:
Windows XP Professional: Microsoft Partners in Learning Program for Governments [17]; Partners in Learning is a global initiative designed to increase access to technology and improve its use in learning, the initiative consists in school agreements, and grants. The school agreement licensing, is designed to provide access to Microsoft®

software for schools, including teachers through work-at-home rights and students through the student option.

Mandriva Discovery 2007 (Linux-based): Annual Volume Licensing to OEM (Original Equipment Manufacturer); a specialized version designed to meet the educational requirements for the classmate PC audience. The Mandriva Linux classmate PC interface combines commonly used terms and icons easy to comprehend. Teacher control software is used in the collaboration between the teacher and the student; it provides a tool for the teacher's to take control over the students classmate PCs in order to deliver the educational material directly to the student as well as monitoring the students' activities15].

Metasys Classmate 2.0 (Linux-based): Annual Volume Licensing to OEM. Metasys is the Linux based operating system specifically created to support the Classmate PC hardware architecture and didactic requirements for classroom educational process. These are the main characteristics [16]:

- Set of productivity applications and tools (office, e-mail, agenda, graphic applications, browser, communication, multimedia, games and more).
- Selected educational applications.
- Local boot via flash memory.
- Installation in the actual microcomputer through pendrive.

OLPC XO-1 [14]
OLPC made an emphasis on software tools for exploring and expressing, rather than instructing. In order to lead the children to become learners and teachers, OLPC intend to use the laptop for their construction of the knowledge, providing them with tools for sharing and criticize these constructions.

According to Papert's observation, that children are knowledge workers like any adult, OLPC created Sugar, an open source interface that captures graphically the world of children as fellow learners and teachers as collaborators, emphasizing the connections within the community, among people, and their activities. Sugar is written in Python programming language. This graphical user interface was originally developed for the OLPC education project and its also available as a session option on Ubuntu (operating system based on Debian Linux distribution) and Fedora (operating system built on top of the Linux kernel). Sugar is a free software, along with Ubuntu and Fedora.

Education project Vs. Laptop project

If we think about the two systems as educational projects and not as laptop projects, we are going to find some real differences in terms of their implementation. Intel designed the Classmate PC to be an educational tool controlled by

the teacher. "The Classmate PC powered by Intel brings the full value of PC technology to bear in helping students and educators in primary and secondary schools by assisting in the learning process. With students using a Classmate PC in class, a teacher can make presentations, guide student's access to the Internet, deliver specific controlled content and interact individually with students and parents in giving tests or providing feedback"[12]. As a teacher student computing solution, the Classmate PC platform is designed to help the developing countries in their educational needs. The platform brings a complete hardware and pedagogical software solution helping the classroom and the content management (Microsoft Windows or Mandriva / Metasys – Linux). The learning objectives are reached through interaction with the local pedagogical content, providers and educators. That sounds like an advantage for the users. However, there is a problem behind it: they lose flexibility by using closed-source software. It means that at some point of the process, the software must be upgraded and therefore money, personal and political interests will interfere in the basic parameters of the initial social cause for the developing countries.

On the other hand, based on Semyor Papert's "Constructionist" philosophy, laptops will enable children to "learn learning" and liberate students to "actively engage with others with similar interests in cultures of learning, providing children around the world with new opportunities to explore, experiment, and express themselves" [8].

While the constructionism philosophy is essential to the mission of OLPC, it is also a source of tension. Educational leaders in Peru embrace constructionism, but most countries base their education systems on the idea that teachers pass their knowledge to students. The OLPC now has a new challenge, and that is to help teachers with a 40-hour course that includes an introduction to the learning programs, basic repairs, and also strategies to develop enough self-confidence to let the children teach them. Although Peru, Uruguay, Colombia and some other countries in Africa and Latin-America embrace the OLPC project, Chinese and Indian education departments call the idea of giving each child a laptop "pedagogically suspect," replying that: " primary-school children need reading and writing habits, not expensive laptops." [5]

Conclusion
The investigation and the comparison of the two projects have made clear the differences between education projects and laptop projects. The Classmate PC focuses more on the intention to be an educational tool controlled by the teacher, and the platform offers the necessary hardware and software solution to help the classroom and the content management. However, it does not encourage the children to create or propose new ways of learning or interaction. On the other hand, OLPC stands as an education project with a clear education statement: young children learn best

by doing. The final goal is to give children in the marginalized communities the power to change the adults, and create a more peaceful world by reaching new human experiences, and in the long-term enable marginalized young people to successfully enter the job market and be emancipated from the vicious circle of marginalization.

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