
ICT Education as a Key Emancipation Factor for Young People in Marginal Quarters of Developing Countries

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Abstract

In this paper we describe the *Fortin* project, which focuses on professional ICT education in situations of social marginality in developing countries. We define reusable tools and intervention methodologies for the empowerment of vocational ICT training activities and we report on a concrete pilot experience in defining and enabling a Baccalaureate Course in ICT at the Escuela de la Consolata, located in the informal quarter called "barrio El Fortin", in Guayaquil (Ecuador), one of the poorest and most marginalized areas of South America.

Keywords

ICT education, marginal quarters, developing countries.

ACM Classification Keywords

K.3.1 Computer Uses in Education: Computer-assisted instruction (CAI), Computer-managed instruction (CMI), Distance learning; K.3.2 Computer and Information Science Education: Computer science education, Curriculum, Information systems education.

Introduction

Marginal districts are a growing reality in all the developing countries, where unplanned urbanization has produced densely populated areas, where people live in absence of the most elementary services. The lack of perspectives fosters crime and marginalization and affects mostly young people. The most effective

means for counteracting these realities is good quality of education and professional knowledge applicable in the local labour market. In particular, training in the ICT sector is one of the most promising areas, thanks to the diffusion of knowledge through the Internet, comparatively low investments in laboratories and infrastructures, high involvement and interest of the students, and the presence of a dynamic job market.

Our work aims at developing a model of intervention and reusable tools for the empowerment of vocational training activities in the field of Information and Communication Technologies (ICT) in situations of social marginality in the developing countries. The final, long-term goal is to enable marginalized young people to successfully enter the job market with a good professional profile and concrete possibility of emancipating from the vicious circle of marginalization. An effective intervention must aim at a standard of excellence in education comparable to those of the best schools in the first world's countries, to convince high-profile and stable teachers to work in socially emarginated contexts and attract the interest of companies towards the graduated students.

Model of Intervention

Our project aims at delivering reusable, long-term results in terms of methodology, network of relationships, and mix of technological tools and devices for empowering schools with ICT education capabilities. The model of intervention that we propose is structured into the following areas:

- The assistance to local schools in defining educational programs, in operational and financial

planning, and in evaluating, selecting and sensitizing students and local teachers.

- Support to the connection of schools to the Internet, promotion of the Web for self-education and autonomous knowledge search, to help break the cultural and communication isolation.
- The establishment of networks with local universities, for the continuous education of teachers in the long term, thanks to students exchange programs between academic institutions of industrialized and developing countries.
- The development of simple tools for the creation and maintenance of collaborative online learning materials by the community of teachers, according to the social approach typical of the so-called Web 2.0.
- The fostering of a dynamic job market through relationships with local businesses in the ICT sector and the launch of micro ICT startup companies by students.
- The dissemination of the educational goals and results achieved by the supported schools, at the local and international level, through Web sites, fundraising initiatives, and activities visibility.

Pilot Experience

The pilot experience aims at activating a baccalaureate Course in ICT at the Escuela de la Consolata in the informal quarter "El Fortin" (Guayaquil, Ecuador).

The context. Ecuador, an independent Republic since 1830, has 13 millions people. The average individual income of around 4.600\$/year and the unemployment rate around 50% make Ecuador one of the poorest countries in South America. Guayaquil, the capital city of the Guayas Province, is the city with the highest rate of industrial and demographic development (3mln



Figure 1: streets and aerial view of the barrio El Fortín.

inhabitants) in the country. The barrio El Fortín is the largest informal quarter in Guayaquil and concentrates half a million people, living in precarious conditions: electric power is illegally distributed, there are no water and sewage infrastructures, streets are unpaved and not maintained. Around 10% of the population has no education and 50% has only elementary education. Unemployment, alcoholism, domestic violence, and high crime rate make the barrio a critical environment for children growth and education.

The school. Escuela Particular N° 960 “La Consolata” [1] has been founded in 1999 by the Missionaries of La Consolata. The school serves the first 6 years of the education cycle, with a very low tuition fee (1.5\$ per month). In year 2000, the kindergarten has been constructed and accredited, and in 2003 the secondary school has started too (Colegio “La Consolata”),

thus ensuring the coverage of the first 10 years of the education program, with an overall number of around 800 students.

However, elementary and secondary education is not enough for emancipation from the critical environment of the barrio. The effectiveness of the education is endangered by the risk of falling back into the lack of perspectives typical of life in the quarter. To avoid this, in 2007 three subsequent years of the education cycle (Bachillerato Tecnico) have been started for three diplomas: System Administration, Accounting Administration, and Installation of Electrical Machines. The extension of the education to the Bachillerato Tecnico requires much higher technical and scientific skills of teachers and substantially greater costs.



Figure 2: Escuela La Consolata, Guayaquil.

Plan of Operations. The workplan of the pilot project comprises technical, methodological, and financial support, for the construction and management of the Bachillerato Tecnico (BT) along three academic years (from 2007 to 2010), so to follow the start-up phase of the two specialization years and one year of work at regime. The coarse operational plan is described in the following phases:

- STEP 1 (Summer 2007): requirements collection and specification. The results of this phase are summarized in the pilot objectives stated previously.
- STEP 2.1 (Summer 2007): connection of the school to the Internet; first organization of two Computer Science laboratories. Implementation of the school web site. As a result, the school had two laboratories with 25 PCs each, with basic software installations on every PC and Internet connection for 10 PCs.
- STEP 2.2 (January 2008): implementation of a full classroom management system: centralized control on software installation and configuration, remote control, firewalling, antivirus, parental control, and online quiz and learning assessment applications. Interaction and relationships with local universities. Identification of key teaching and managing persons.
- STEP 3 (Summer 2007-February 2008): definition of the teaching programs for the three years of Bachillerato, by analyzing the official programs of the Ministry.
- STEP 4 (Spring 2008): support to the start-up of the teaching, thanks to one European ICT expert working on site together with teachers and students. Training the teachers in the use of the Web as a continuous self-education tool and as an instrument for the students.

- STEP 5 (planned for 2008): identification of existing teaching material and cooperation with the local teachers in the production of high quality novel courseware; establishment of an international network of teaching material producers and of online repositories of free materials to be used by any school.
- STEP 6 (planned for 2008-09): connection to the job market for fostering interest on candidates from the companies and micro start-ups by students.
- STEP 7 (planned for 2009-10): repetition of the experience in other schools. Contacts have been established for collaborations in different environments (a school in an local community in the humid forest and a school on the Chimborazo Mountains).

Conclusion and future work

In this paper we presented a working project for helping the emancipation of young people of marginalized quarters in developing countries. We are currently experimenting the methodology on a pilot case in Guayaquil, Ecuador. Intermediate results are encouraging, since we managed (1) to dramatically increase the technological tools of the school; (2) to get students and teachers involved in the Computer Science world; and (3) to involve local partners (universities) and European funding agencies.

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