Technological Projects as a Social Inclusion

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Abstract - **In Argentina, during the last 15 years, a process of diminishing enrolment at high-school was registered, while high-school drop-out increased, especially within low socioeconomic groups. Facing this educational reality, some teachers of the School of Engineering at the University of Buenos Aires have started a project whose aim is to raise the level of expectations of children and young adults who are at educational risk, so that they stay in school and have access to an education that allows them to be members of the world of knowledge and work. This project, which received a University of Buenos Aires "Social Emergency" 2004 grant and a YPF Foundation "Strategies for school retention" 2004 grant, offers students of an inner city high-school the possibility to participate, coached and advised by the professors of the School of Engineering, in technological projects involving solutions to actual problems, and then transfer their experience to elementary-school students, working with them within the technological K-8 area. An important goal of this project is to analyze the impact that these technological activities have on these students' level of expectations. Our hypothesis is that through participation in these technological projects we will be able to: 1) diminish school drop-out in the population at educational risk. Promote the acquisition of technological competence by children and young adults; 2) raise the level of expectations of children and young adults belonging to low socioeconomic groups; 3) integrate the work of researchers, teachers, and students to solve real problems involving technical, methodological, organizational, conceptual, social and ethical aspects.**

Index Terms – Technological Projects, Educational risk, School drop-out, University relationship.

INTRODUCTION

In this paper we describe a project in development now whose main interest is to focus on technology education as a starting point for social integration. This project relates the different levels of the educational system: University, high-school and primary school to work for the solution of real technological problems for kids and young adults of lower socio-economic background that grants them a proper education in the world of knowledge and work.

The initiative was conceived by the University of Buenos Aires in 2004 [1], to promote the development of projects that could bring solutions to real problems in society and from the first project of this kind in which the School of Engineering and the 13 de Julio Institute have worked together since 2001. The main educational objective of that project was to integrate

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researchers, professors and students of different levels to work for the solution of real technological problems, involving different aspects: technical, methodological-organisational, conceptual, and social [2].

The double side of the project, combined economic resources arising from the University grant and the experience from previous years, led us to search for new social actors that would compromise with the problems of school drop out and social exclusion by providing resources.

In this first stage, we remark the initial agreements, the accomplishment of the pursued objectives and the obstacles that made new challenges possible.

SOCIAL ACTORS INVOLVED

We understand that the participation of different social organizations enriches our proposal, therefore the School of Engineering signed agreements with several institutions.

The initial agreements were with:

- El Gobierno de la Ciudad de Buenos Aires, Secretaría de Educación, Dirección General de Gestión Privada: governmental organization.
- El Instituto de Educación Técnica y Formación Profesional 13 de Julio: Secondary school conformed by low socioeconomic background students ranging from 13 to 18 years old, with unemployed parents and housing problems.
- El Sindicato de Luz y Fuerza Capital Federal: Union organization which groups electricity related company workers.
- EDESUR SA: the leading utility in the Buenos Aires electricity system and the private-sector multinational electricity utility in Latin America. [3]

In a second stage, this project was awarded with "Educación para Jóvenes 2004 "price promoted by the Fundación YPF, which was also extended to primary schools. New agreements were signed with two other organizations:

- El Gobierno de la Ciudad de Buenos Aires, Secretaría de Educación, Supervisión de Educación Primaria: governmental organization.
- The YPF Foundation: Created in 1996, strives to promote, stimulate and participate in educational and cultural initiatives, with an emphasis on involving Argentina's younger generations in scientific research and professional and technical training. The YPF Foundation awards scholarships for study both in Argentina and abroad, thus contributing to the formation of Argentina's scientific community [5].
- The Institute of Electrical and Electronics Engineers: Professional association that promotes the engineering process of creating, developing, integrating, sharing, and applying knowledge about electro and information technologies and sciences for the benefit of humanity and the profession [6]
- Escuelas Nº 22 D.E. 4 Dr. "Guillermo Rawson" y Nº 8 DE 4 "Carlos Della Pena": primary schools, students from 6 to 13 with educational risk, have lunch at school, live in illegally occupied houses or in the hotels of the Government of Buenos Aires.

EXPERIENCE

In an early stage, the activities will be developed in Instituto 13 de Julio with the collaboration of interdisciplinary investigators. We subscribe to an Internet Group, named FI13, to promote the comunication and conform work areas:

- Educational Research.
- Design, assesment and capacitation for the technological projects: Computational Area.
- Design, assessment and follow-up for technological projects: Electronics Area.
- Capacitation for school teachers.
- School Projects Follow-up

I. Educational Research Area:

We developed a survey addressed to Instituto 13 de Julio students to assess their prospects and compare them with future data. Data was processed with Nudist program for quantitative analysis. We asked students from 3º, 4º, 5º and 6º year for a brief report explaining their school situation and how they see themselves in that environment.

In-deep student interviews were done.

Meetings were recorded and sometimes filmed.

II. Design, assesment and capacitation for the technological projects: Computational Area:

We agreed in the possibillity of making web-based projects. A four-module course was established: "Introduction to Programming" (using Java), "Web Design and Local Area Networks", "Visual Basic programming", and "Introduction to Databases". Details regarding this area are presented on 2005 [7].

III. Assesment, design and capacitation area for technological projects development: Electronics area:

13 de Julio teachers issued some interesting subjects to work with. An initial course in microprocessing hardware was organized for teachers and advanced students, divided in theorical and practical classes, including laboratory experiences, which is taking place in the engineering school.

IV. Capacitation for primary school teaches and project in schools

Integrated by teachers from the Instituto 13 de Julio and University teachers, it will design modules aimed to the train teachers from the science and technology areas of primary schools to adquire the methodological tools suitable for the project, that would allow the utilization.

CONCLUSIONS

The Argentinian social crisis and its impact on the educational system issues new challenges for the University. The irruption of distinct cultures in classrooms, the problematics of the school desertion and the youngsters exclution from the world

of knowledge and work, places the investigators and professionals of education in the quest of answers and solutions for the problems.

Having something to start the research with made the experience plausible. The previous experience allowed us to begin with modest proposals that could be done in the school area and practice oriented us through the process and the unexpected situations. The actual technological projects for the students could not be anticipated, as we had to evaluate the expectations, knowledge and the disposition of the educational community; but also to guarantee ways of communication, work modalities and the participants' necessities.

Based on these interactions and developed courses, 13 de Julio students are grouping according to similar interests for the completion of different projects involving technology. Some of them will be developing computer projects, while others focus on electronical or mechanical ones. Other students will take part in an Engineering student's major thesis which regards the construction of a satellite.

Some students recommended new projects, as the realization of an hidroxigene pile, therefore we had to ask for the collaboration of investigators from the School of Natural and Exact Sciences. Looking ahead, the second semester of 2005 will initiate to interact with primary schools in order to define common objetives and schedule meetings.

It is planned to start working with primary school students in 2006.

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