Articulating two social based informatics projects

Lic. Javier F. Díaz,
Lic. Claudia Banchoff Tzancoff,
CC. Viviana Harari
Lic. Ivana Harari and
CC. Viviana Ambrosi*

Research Laboratory of New Information Technologies (Linti).
Faculty of Informatics, National University of La Plata
* Committee for Scientific Research in Buenos Aires Province (CIC)
La Plata, Buenos Aires. ARGENTINA.
[javierd, cbanchof, vharari, iharari, vambrosi]@info.unlp.edu.ar

Abstract

The Faculty of Informatics[1] of the National University of La Plata (Buenos Aires, Argentina)[2] is renowned among other things for its high participation in outreach projects of social character. One project is Computer literacy for disadvantaged children in society. It consists of a gradual and systematic training on ICT for children and their family environment who attend social eaters1 in neighborhoods on the outskirts of the city of La Plata. Since 2007, this project has been presented in different calls for outreach and volunteer projects and has been credited on all occasions and several times subsidized by university and government entities.

Another project of no less importance is the EDU-WEE2 also accredited and subsidized by university and government entities, which consists of a process of assembly of PCs from components and machines donated by the community that are in disuse. This PC re-assembly has a dual purpose: first, to reduce electronic waste, and second, to contribute to the task of bridging the digital divide, as reassembled machines are donated to educational, social or health institutions that do not have computers.

This article will explain how a third project based on these two was created, combining the most important characteristics and activities of each one. This pilot project was conducted during 2011 in one of the social eaters with which we have been working in the Computer Literacy Project for over 4 years. The recipients were the young working adults, recruited through a cooperative, in that social eater. In order to recover these youth from street and from addictions, the cooperative hires them to perform maintenance tasks in different non-profit civil associations. The Computer Literacy Project, along with the social eater´s referent designed a course conceived for these young people to improve their employment opportunities.

In planning the special course for these young adults, the idea of coordinating it with the project EDU-WEEE to put together a very practical course that traps the interest of the students. The resulting course was "Basic PC Repair". In the process of articulation, different aspects were taken into account: cost issues, shaping common objectives, articulation of contents, integrating methodological aspects and other articulation aspects. The results obtained in this experience will be also exposed, considering the number of participants in the project, as well as the institutions involved, volunteers, activities carried out together, problems found, among others.

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1 The main activity of social eater is to provide meals for children during the five working days of the week. Some extend their activities to weekends or give food to be consumed in family homes. Many social eaters make exceptions and provide their service to elderly and pregnant women. They tend to give school support, and in some cases provide other services, such as legal counselling, nutritional control, psychological or medical care, job bank and wardrobe.

2 Abbreviations for Electrical and Electronic Waste

The actors and sectors involved in this integrating project, with their joint work form a synergistic team of unexpected size and scope that enabled to improve the entire educational process, achieving a multidisciplinary and collaborative approach and higher effectiveness in bringing ICT to marginalized sectors.

1. Introduction

For several years the Faculty of Informatics of the National University of La Plata, has been active in projects that use different mechanisms but agree on one common goal: to contribute in reducing the digital divide and to promote social inclusion. In particular, the Computer Literacy Project focuses its work on training geared to using the computer as a tool assistant in various activities: when it comes to children, the approach is to use them to supplement their school activities and when it comes to adults, the focus is to think of its use as a mechanism that integrates the services provided by the state (on-line procedures, for example) or use of tools to expand their job opportunities. In the case of the EDU-WEEE project, activities focus on the recovery of computer equipment and the dissemination and awareness of environmental care aspects. Since it has numerous computer parts, the craft school has joined the project, so as to provide training in issues related to testing and repairing hardware.

During 2011, in one of the social eaters where the project Computer Literacy intervenes ("Las Tablitas"), the possibility of training a group of people with particular characteristics raised. This led to a pilot project combining the Literacy project and EDU-WEEE related to teaching hardware repair. For this a common goal was set and work was carried out in a coordinated manner. Although this pilot project included a single group of students, it served to establish a joint planning and to establish the basis for replication in other institutions. Teaching computer repairing is not new. Many institutions have done it for a long time. The highlight of this initiative involves two factors. On the side of the University, these activities encourage the incorporation of outreach work both for students and teachers, especially in this case, promoting the coordination of two independent working groups. On the side of the target organization, it can prove to the community involved that it is possible to access and work in conjunction with the University (often thought of as "unattainable" for certain sectors of society) and that with effort and perseverance they can obtain better opportunities.

2. Characteristics of the computer literacy Project

In early 2008, the project "Bridging the digital divide in children and young people", certified and subsidized by the National Ministry of Education [3] through the National University Volunteer Program (call 2007) [4], began to work with children and young people from humble sectors of the city of La Plata and surroundings, in order to reduce the digital divide in this sector.

The group of people who voluntarily form part of this project was composed of teachers and university students, mainly from the Faculty of Informatics, UNLP.

To achieve the goal they coordinated previously with the referents of the social eaters of the neighborhoods where they would work, who would be responsible for convening the children and youth and build the list of potential students for courses, as they had direct contact with the locals.

With the lists of students the groups were formed by ages to carry out training according to each group. Although it was intended for all students to acquire basic computer skills, each group was given a particular orientation. For school children the orientation was directed to the application of information technology in educational issues. The basic idea here was to get the child to visualize the computer as a study tool, such as the book, notebook, pencil, etc.

For adolescents, the orientation was towards computer training to allow them in the future, access to decent work.

Like most of the social eaters at the time, they did not count with their own resources, that is, they did not have a set of computers where students could develop their activities, they had to work in cybercafes near the eaters. For this, they coordinated the rent of all the computers during the hours of the course, with the owners of the shops.

The project teachers were in charge of the basic design of classes with their theoretical notes and practical guides, and among all the teaching staff (teachers and students collaborators) they imparted the training.

The course material did not remain still, on the contrary, it was updated and modified throughout the project development, either by teachers or by the student trainers.

In the first year of experience they worked with three neighborhood social eaters and trained a group of 10 teenagers and 77 children aged between 6 and 12, where only 14.3% had had previous contact with a computer [5].

In subsequent years, the project continued under different names and subsidiary institutions (National University of La Plata and Ministry of Education's Office), but the goal was always the same: to reduce the digital divide in disadvantaged sectors of society. Over the years we continued with advanced training of the initial groups and with the initiation of new groups, both in the pioneer civil associations and the new ones that were incorporated. Currently the project has a waiting list of entities that are interested in receiving the training.

Regarding the extension of the project, it was not only imparted in the number of civil associations that joined, but also in the target group. Due to the need to impart the courses in the cybercafes near the social eaters or nonprofit civil associations, many mothers of young children accompanied their children to training. In the second year of project development, ongoing contact with teachers and with training made one of the mothers present her concern about taking the course along with the children, accommodating to their level. The request took effect and the mother began a training which continued in subsequent years.

This mother's initiative was echoed by others who raised the possibility of learning Informatics to end with their digital illiteracy condition and to advance in their jobs. This led to extend the project target group to "family of children and youth". In fact, following certified and funded project is called "Inclusive computer inclusive in disadvantaged sectors of society: Introducing ICT to children and family groups".

Over the years, about 25 adults, relatives of children and youth, have been trained, among which stand out moms and grandparents. Many have highlighted the opportunities provided with training, from advancing in their jobs to the possibility of carry out for themselves tasks on the computer for which they previously required the help of others.

In 2011 another fact caused the target group to expand again, but this time generating the creation of a pilot project that gave place to the experience that is presented in this article.

In the beginning of this year, one of the social eaters with which the Computer Literacy Project has been working since its inception, Non-profit Civil Association Las Tablitas [6], raises the possibility of a course for a group of young people and adults between 17 and 35, some with legal issues and others, street workers. They arrive at the social eaters through a cooperative to help reintegrate them into society, they get an allowance for general maintenance activities at the site.

The social eater's referent, Cristina Garrido, raised the possibility of imparting an Informatics course for these youngsters and adults taking advantage of the fact that the assigned tasks often left them free time that could be exploited in training.

Faced with the characteristics of the group: 16.7% with no schooling, 58.3% with partial primary education and 25% with lower secondary education, the course was conceived to focus on more technical and practical aspects than theoretical, and thereby, be able to encourage its implementation and continuity. From this analysis emerged the possibility of a course in "Basic PC Repair," which met the stated requirements. In order to carry it out we combined the computer literacy project with another project of the Faculty, called "Computing: academic jobs and internships for social purposes", whose characteristics and objectives are described in the following section.

The proposal was accepted by the target group and classes began in March 2011, with a periodicity of one day per week for two to three course hours.

3. Edu-WEEE Project features

The accelerated production process of the electrical and electronics industry caused by the design as well as the development of new products, technology turnover induced by Moore3's Law that goes along with the increasing software development, the obsolescence of the things and excessive

and not assessed society consumerism, are setting current and future trends regarding the problem of electronic waste. All these questions lead us inexorably to an accelerated increase of unused or obsolete equipment and the need for development of various proposals and strategies for mitigating the risks related to this that must be designed and planned by the University, considering environmental social and educational aspects.

Furthermore, considering that in 2011 in Argentina there were approximately 100,000 tons of electronic waste produced per year [7], the lack of a specific regulatory law in force nationwide, the ignorance of people about the toxicity of some elements used in the manufacture of components, and the use of levels above those allowed in the manufacturing stage, make these poorly treated and poorly prepared residues become potential pollutants and toxic elements.

In response to this problem, in early 2009, the LINTI [8] and the Department of Environmental Awareness from the Faculty of Informatics, National University of La Plata, started the project Edu-WEEE, as presented to the Project call of University Outreach of the UNLP, but better known from its beginnings as E-Waste [9].

The project implements a work platform that addresses the problem of WEEE (Electrical and Electronic Equipment Waste) in the region. It helps reduce the digital divide by reuse, recovery and donation of computer equipment. It helps support the environment through safe disposal, and spreads between the community initiatives that promote and encourage the development of Green-IT skills among students and society, while promoting social responsibility of universities and working in raising awareness environment.

The project, carried out by teachers and outreach and volunteer students is aimed at the most disadvantaged, children, teenagers and adults attending social eaters, community centers, schools, rural schools or areas with socio-economic problems or risks, who are the direct beneficiaries of the project, and receive the reconditioned material for free. Also through CSOs (Civil Society Organizations), the project partners, the scope of the recipients and beneficiaries is extended. We can say that there are also indirect beneficiaries. They correspond to the entire community and in particular teachers and students of the University for the awareness, knowledge of the problems, contribution to reducing levels of electronic waste and environmental pollution. In addition, it encourages university outreach activities which contribute to the mission of the UNLP and improves life quality.

In this context, and through our work and experience, we received various societal concerns about the possibility of extending knowledge in the repair of PC (acquired by students involved in the project) to various actors in society to provide a specific job opportunity and social integration. This was reflected in a E-Waste appendix project called "Informatics: occupations and academic internships for social purposes". This project is just a trade school, which has among its objectives the delivery of courses for PC repair and the implementation of "academic internships" for students in their final year of high school, it is carried out using the elements, tools and hardware resources from the workshop of E-waste Project, which allows which enables training, testing, repairing and collaborating with donations. Throughout all the training stages it includes environmental awareness on problems generated by WEEE.

Thus we have a link between information technology, environment and society.

4. The process of articulation

As explained in previous sections, both projects were combined to train a group of youngsters and adult with specific characteristics, with the aim of providing useful tools when looking for a skilled job.

Student evaluation on computer knowledge showed that only 25% of students had minimal knowledge about computers, and 75% had no knowledge at all. Given the low overall literacy of students and as the various activities of the projects (Computer Literacy and EDU-WEEE) did not conform exactly to the characteristics of this group, we designed a special training for this case. Training was divided in different stages, with initial objectives that could potentially be modified during the course. This division allowed members of both projects to carry out periodic evaluations together and discuss whether the next step is continued as programmed or with modifications.

The main job established for this training was the construction of a digital "Manual for Basic PC Repair", made by the students. The decision for making this manual came as a response to the question of how to help

students learn to use computers in an entertaining and nontraditional way. By making this manual they would learn not only to become familiar with computer use but they would also learn to use different applications like a text editor and a plotter in a more natural way, when they needed them.

It was also defined that the group of student collaborators teachers from the Literacy Project would accompany the course throughout all its development and the student collaborators from the EDU-WEEE project were to intervene only when they conducted the workshop for machine assembly and disassembly. Teachers of both projects were to meet periodically to discuss the development of this training and were to adapt the material so that it would be more practical and easy to understand for students.

Upon completion of training, the phases were configured as follows:

- In the first one, there was given basic knowledge about computer use and the features of the external and internal components of computers were explained. To consolidate their knowledge, during this stage, students began writing their own manuals in digital format. The duration of this first stage was three months and only of the teachers of the literacy project were in charge.
- In the second stage, with the initial knowledge acquired by students, the PC repair workshop began, where they were taught the basics on the subject. The duration was one month (four classes), and the EDU-WEEE project partners were in charge of the workshop. During that period, the students continued with the preparation of the manual, capsizing everything they learned in the workshop.
- In the third stage, teachers in the literacy project continued with training, advancing on knowledge of the Internet, using Web and email. The duration of this stage was two months.
- In the fourth stage, the project partners of trades again reunited with the group to advance further in the workshop. This stage lasted a month and students continued with the construction of their own manual.
- The fifth and final stage was designed to reinforce the concepts learned and finalize the material created by them. We can highlight two activities undertaken during this stage. The first is related to two visits of students from the University shelter, property that belongs to the UNLP where the workshop of the EDU-WEEE project was working and where the conditioning of the donated computer equipment was carried out. The students worked together with the Workshop staff, thereby gaining real team work experience. On the second activity the Computer Literacy group took to the room, where they dictated the course, a set of machines with different problems, prepared specially for them. Without the presence and assistance of the Repair Workshop Group, Students had to fix them recalling their lessons and using the manual made by them. This activity was very successful because the students were able to repair the computers. That helped them realize that they were prepared to undertake such tasks alone.

While at the beginning when the course was planned the possibility of teaching basic concepts of PC repair was raised, no one knew how the group would respond. For this reason, at first a short intervention of the members of the trades project was planned, as a survey to assess the level of interest and acceptance of students. By the end of the second stage, the students showed great interest in continuing to learn about computer repair.

- The enthusiasm shown at this stage was reflected in several actions taken by the students:
- They participated in the PC repair of the social eater to which they belonged.
- Some students brought their own computers to the workshop that had been donated to them and were not working, with the intent to repair them, commenting their emotion when their children saw the repair done by their father.
- Others, who quickly caught the concepts taught by the trainers, tried to explain to their partners that had some difficulty in understanding. This encouraged the group of trainers to organize another stage with the participation of the trade workshop group.
- The motivation in the participation of repairing the PCs to be donated to other institutions.
- As part of their course they received wristbands to protect the machine components from static electricity, to be used in their homes if they attempted any repairs.

4.1. Methodological articulation:

Here are the activities carried out by this pilot project throughout the training and the articulation between base projects.

Activities	Main actors involved
Meeting with the referents of the social eaters	Computer Literacy Project
Verification of the physical location to impart the workshop on PC assembling and dismantling	EDU-WEEE Project
Reconditioning of PC Repair training material	EDU-WEEE Project
Reconditioning of the training material with contents only of Computer Literacy	Computer Literacy Project
Creation and delivery of training through workshops with contents articulated on Computer Literacy and Computer Repair	Both Projects
Organization of the study material	Both Projects
Evaluation and selection of open source educational software for training	Both Projects
Classes on computer basics	Computer Literacy Project
Classes on PC assembly and disassembly	EDU-WEEE Project
Organization of visits to the EDU-WEEE Project Workshop	Both Projects
Dissemination in conferences, publications, lectures in social events	Both Projects

6. Project Results

Both projects had been working together in the articulation of two tasks, one related to the survey of needs of different computing resources in the different CSOs where computer alphabetization was being carried out, and the other related to the donation of several PCs to these institutions so they could build their own computer room.

The particular experience of the pilot project was different, due to the nature of the group involved and to the training that had to be designed.

We can say that the combination of both projects in this intervention led to very satisfactory results both for the students and the team.

Regarding students, although 45% achieved the certificate of Basic PC Repair, it is noticeable that the rest of the students were unable to complete the course due to labor reasons (the cooperative that hired them took them to another workplace) and not for lack of interest. Unfortunately, the precarious economic situation of the students made it impossible for them to object to such a decision even if they declared their interest in continuing the course.

Regarding work experience between the two projects we can mention: the joint will between students, teachers and administrators, and the formation of a team of 8 people were key components for the process of articulation to be considered a success.

7 Conclusions

Again from the Faculty of Informatics, National University of La Plata, we thought on a way to collaborate to bring society alternatives that can reduce social problems. This time we thought on how to get a group of young adults, street workers and with legal problems to obtain tools to look for qualified job and reintegrate back into society.

As an alternative to this scenario a pilot project aimed to train this group in basic PC repair was generated. The initiative was a product of the merger of two social projects of weight that has been taking place for several years in the University institution.

The experience was very enriching for both recipients and for members of the projects. For the former, because they had the opportunity to train and realize that "they can also do it". In addition they learnt that with perseverance and dedication they can move forward and can try to leave the marginal condition in which most of them are. They could also could also see that there was a group of people who selflessly worked towards it attainment.

For members of the project it was very satisfying to see how students were progressing in their knowledge and showed great interest in what they were learning.

At the end of the course, those students who completed it received a recognition of their efforts through a diploma delivered in the Faculty by the highest authorities and with the commitment of both parties to continue education and training themselves as future trainers of young people in their same conditions.

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