Computer Science Teacher Training – The Computer Science Degree at an University in the “Baixada Fluminense”

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Abstract: This work aims to report the experience of training teachers in the computer science degree course at UNIGRANRIO, university located in the city of Duque de Caxias, in the state of Rio de Janeiro, Brazil. It presents the profile of students graduated in the course, the disciplines that take part of the plan of study and some examples of activities undertaken during the course, especially those offered in the distance mode, as well as those related to the use of Logo, Robotics and Author Software language. There are also reviewed the work developed in the discipline of probation and the issues addressed in the monographs submitted by the graduated students from 2005 to 2008.

Key words: Degree in Computer Science, Education, Computer Science Education, Educational Technology, Teacher Training

1. Introduction

The teacher training in computer science has been the subject of several studies, which are devoted to assess the best way to empower the teacher to use this technology in their pedagogical practice. This concern is justified, as they are developed, currently, large government programs - at the Federal, State and Municipal range - which are related to the computerization of public education, in order to use the new information and communication technologies - NICT in the teaching-learning process. These programs have different proposals, with regard to the configuration of the equipment used, operational systems, the use or not of educational software and Internet. However, there is a consensus that the key issue to use the NICTs in all its potentialities, is in teacher training.
2. Computer Science Degree

Teacher training for the use of the computer science as a tool to be used in the educational process, has been made in several ways. Some teachers seek the free courses offered by a few companies, which have, in general specific goals, as to teach the teacher to use a particular educational software, or to use the Internet, make use of the word processor in an educational way or how to use an authoring software to develop their classes. These courses have as a characteristic a superficial approach of the issue of computer use in education.

The courses of education and degree in general, typically have in their plan of study, one or two disciplines that address the issue of new technologies, usually called "Computer Science in Education" or "Computer science in teaching-learning process." However, it is very few for the professional that is being built to feel comfortable to use the computer science as an educational tool in their classes.

There are also post-graduate "Lato Sensu" courses, which offers a specialization in the computer education field for those who have already finished the university. For the very nature of the post-graduated course, it is still relatively small the number of teachers willing or able to do so.

In this sense, the proposal for a course in computer science degree, is precisely to build an educator who is able to use the technological resources available in the various situations of education. This professional can act as a computer science teacher or as a technological guide in which he identifies needs related to the use of the available technology, proposing solutions and suggests adjustments on programs, projects and content of classes. Moreover, this professional may update, continuously, the teaching staff of the institution, regarding the possibilities for the use of the technological resources available.

3. Computer Science Degree at UNIGRANRIO

The computer science degree course at UNIGRANRIO is offered since the first semester of 2003. Its proposal is to train teachers able to work in elementary, middle and professional schools as in the training sectors from public and private organizations.

The students of the course are, in great majority, residents of the municipality of Duque de Caxias and around 50% of them are already computer science teachers or have had teacher training in high school – normal course.

The plan of study of Computer Science Degree offers disciplines related to the technical area (algorithms, programming, Web, Operational Systems, Networking Basis and Database), teaching subjects related to the pedagogic area (Science Education, Interpersonal Dynamics, Themes and transverse Projects) and others, which are most, and have a character of integration of these two areas (Computer
Science Workshop of Information Technology, Computer Science in Primary School, Education and Media, Computer Science and Society, the Distance Learning, Computer Science in Inclusive Education and supervised probation). Besides these, are the subjects of Scientific Research Methodology, Monograph I and Monograph II. The student building is completed, with the need to prove the same hours of additional activities, which can be proved with participation in events, presentation of works at conferences and seminars and activities on social projects related to technology.

Some courses are offered at a distance, using a Virtual Learning Environment, which gives the student the experience of using this model of education, based on the Internet in their own training.

### 3.1 Disciplines and Integration

Some courses stand out in relation to the integration of computer science to the teaching in so far as to give opportunity to the practical experience of the students in elaboration of projects, materials and activities that are part of the teaching practice. Some are given below:

#### 3.1.1 Distance Learning

This discipline deals with innovative and relevant issues of the Brazilian Education, as the need for discussions about the new prospects of information and communication technologies for education. It discusses concepts and prejudices related to the modality of the Distance Education and tries to identify and argue about the political and legal aspects of this teaching mode. It is offered at a distance.

#### 3.1.2 Computer Science and Society

Given at a distance, this discipline broaches from the history and evolution of the Internet, to the impacts of new technologies in the contemporary world, such as copyright, electronic publications, Web Radio, among others.

#### 3.1.3 Computer Science Workshop I

This discipline has as object of study the Logo language and its relations with the constructionist approach of education, being studied, too, its integration with robotics and the plan of study subjects. The activities are based on interdisciplinary projects developed by students using the software Superlogo 3.0, interface for robotics and scrap for creating models.

#### 3.1.4 Computer Science Workshop II

This discipline has as object of study the Author software Everest, their possibilities for creation of a multimedia and hypertextual material and its integration with projects in robotics. It analyzes the potential use of the author
software by the educator, to produce material for the classroom, as well as by the student, to perform their work and presentations.

3.1.5 Supervised Probation I and II
In these subjects the students need to plan and give classes, under the guidance of a teacher in at least two different levels of education, may be in early childhood education, elementary school, high school or technical education.

3.1.6 Monograph I e II
In these subjects the student develops one foreground of monograph and the final monograph at the end of the course about a subject related to computer science and education. From 2005, it is required of the student, that his research includes some type of field research, case study or implementation of technological resource.

4. Conclusion
The integration of NICTs in education has been fairly slow, and sometimes without a clear criteria about the ways and results that are expected of it. Therefore, it is necessary to invest in the training of teachers with ability and interest in new technologies, which have a training that allows them to talk to the various actors in the educational process, being aware of the possibilities and limits of the resources of NICTs. This professional must be a researcher and a leader, to identify need, suggest new ways, fostering curiosity and interest in NICTs by teachers.

References