

# ICT in Portugal - A chronological view and the lessons learned

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**Abstract:** The accelerated evolution of information technologies and their impact on society in general have in effect motivated special attention within the scope of the educational system. This paper presents the state of the art in what concerns to the Portuguese national projects on ICT. A chronological presentation of the several projects, emphasising their main objectives, activities, problems and outcomes will be discussed. The main aim of this paper is also to reflect on the consequences of those national projects regarding their impact in the process of teaching and learning within the Portuguese educational system.

## Introduction

It is a fact, agreed by all the governments, that ICT is nowadays the basis of our society. Therefore it is important to ensure that ICT is part of schooling activities. However '*change*' is always difficult. It is necessary time, '*trial and error*' because most of the teachers are dealing with '*novelty*' (Conlon, 1999).

This paper describes all the national projects, objectives, activities, involvement, problems and outcomes. It is important to learn from previous lessons and analyse critically the implications and the results taken from all projects that intended to introduce ICT as a regular tool in the Portuguese Educational System, many lessons can be learned.

The educational society which we are creating demands a redoubled effort as far as the creation of reference centres which promote quality and excellence are concerned. Equality of opportunity implies refusing to level according to lower standards. Only in this way can we fight against the periphery effect, which is so clear in a society like the Portuguese.

The accelerated evolution of information technologies and their impact on society in general have in effect motivated special attention within the scope of the educational system expressed in the design and development of specific programmes.

## Portuguese National Projects on ICT

### Carmona Project

The first attempt to introduce ICT in education dates back to 1984 with the proposed CARMONA project (its name comes from the name of its co-ordinator) created by the Dispatch no 68/SEAM/84. It was never put into practice but its theoretical framework settled the basis for discussion about the importance of ICT in schooling. It aimed to develop computer literacy of the Portuguese society through Education creating links between school and society in order to highlight the image of school promoting innovation through extra-curricular activities (Carmona et al, 1985, p. 17-22)

## Minerva Project

Amongst these programmes - aimed at introducing new technologies within the scope of education, as well as training experts capable of taking full advantage of their capacities - the MINERVA project must be highlighted. It was created by Ministerial Dispatch ner 206/ME/85, of October 31st.

Its main objectives were to provide schools with information and communication technology equipment and educate teachers and teacher trainers; to develop educational software and to promote educational information and communication technology research to help improve the teacher's role in the teaching/learning process and to open schools to the outside world. It also aimed to develop information and communication technology skills in students for use in active life.

It developed in two phases: (1) pilot and (2) expansion. In the pilot phase of the project computers were seen as having two main purposes: (a) the teaching of computing skills and (b) as a technological instrument to support the teaching/learning process of various subjects.

MINERVA was an important project in the modernisation of schools and stimulated increasing participation of schools, teachers and students through emphasis on the relationship and exchange of knowledge among teachers of different education levels (Tavares et al., 1992). Some concerns were shown in the opinions of the evaluators of this project (O.C.D.E., 1994) as far as the future of ICT in the Portuguese educational system, specially regarding the provision of hardware and software to schools and training schemas.

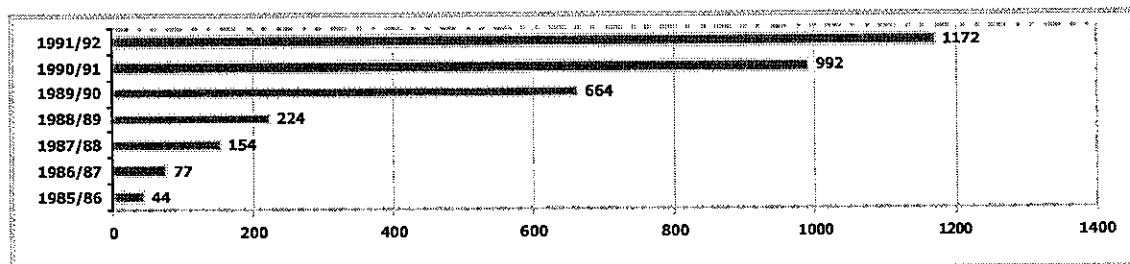


Figure 1: Number of schools within the Minerva Project .

The main conclusion and recommendation of the development of this project up until 1994 and the respective assessment was the need to, "understanding the technologies as a means of facilitating and potentialising the teaching and learning processes", develop an integrated strategy for the introduction of Information and Communication Technologies in Education, with a strong scientific and pedagogical perspective.

## The IVA Project

Project IVA (Informatics for Active Life) was conceived to equip secondary schools, train teachers and teach students in IVA laboratories. These were equipped with a mini-computer connected to twelve terminals and several other peripherals to print, mail and receive information.

This project was developed between 1989 and 1992 and was financed by the MINERVA budget.

IVA involved 28 secondary schools throughout the country and about 300 teachers and 6,000 pupils were trained.

The specific targets of IVA were to provide 12<sup>th</sup> grade students with information and communication technology laboratory facilities and educate teachers in the information and communication technology area, focusing on MS-DOS and UNIX utilities. It also aimed to develop educational activities for 12<sup>th</sup> grade students promoting co-operation between schools and the local authorities for the implementation of computer-based projects.

IVA educational activities totalled 140 hours per year of learning practice conducted in 2+2 weekly classes. Activities were organised in units allocated to specific projects, and some of the projects were developed in co-operation with local authorities.

Topics covered by the IVA project included basic concepts on MS-DOS and UNIX systems; word processing and desktop publishing; spreadsheets; database management; introduction of other professional software; computer networks and electronic mail.

An important seminar took place in Lisbon in June 1991 to evaluate training and school activities within IVA. Since the networks for this project were already installed, ideas were considered for the design of another training project for teachers of secondary education, with trainers being teachers themselves - the FORJA project.

### **FORJA Project**

FORJA was part of FOCO (In-service Education for Teachers) and provided teacher training. FORJA was seen as the first important step in implementing a systematic structure for in-service training in the area of ICT. It was created by GEP and involved secondary schools from 1992 to 1994.

Its main objectives were to ensure the training of secondary teachers in a fast and effective way to promote the insertion of students in active life and actualise the teaching process by means of ICT. FORJA introduced homogeneity in the contents of the training curricula, because the supplier of the hardware had also to be responsible for the training of the teachers. All the schools involved had to be trained in: (a) word-processing; (b) spreadsheets; (c) databases; (d) drawing applications; (e) desktop publishing; (f) telematics; (g) library management; (h) educational software and (i) project development and management.

### **Nónio-Século XXI Programme**

Following previous projects in which relevant experiences of educational usage of Information and communication technology (ICT) were carried out, the programme NÓNIO-SÉCULO XXI - Information and communication technology in Education Programme was created by ministerial dispatch of the Ministry of Education dated October 4th, 1996.

Recovering the experience developed and expanding on it, Nónio intends to carry out the new project in the scope of primary and secondary schools, with the support of institutions directed towards that purpose, namely the higher education institutions - through the upgrading of acquired knowledge and promoting its development with the demonstration effect with communication tools and multimedia equipment and material. Through the introduction of the new technologies in education, namely in co-operation with the Ministry of Science and Technology, through the continuing training of teachers in this field, through the production of educational software and through the incentive to the networking effect and to international co-operation, the Nónio-Século XXI Programme aims to launch a gradual development experiment, of a continuing nature, which will enable Portuguese schools to update themselves, while promoting precision, quality and autonomy.

1. The Nónio-Século XXI Programme is created aiming at the production, application and generalised usage of the information and communication technologies in the educational systems with the following objectives, amongst others:

- a) the improvement of the conditions in which the school functions and the success of the teaching-learning process;
- b) the quality and modernisation of the educational system's administration;
- c) the development of the national market for the creation and edition of educational software for pedagogical, didactic and management purposes;
- d) the contribution of the educational system to the development of a more flexible and participated information society.

2. The Programme has the following specific objectives:

- a) Supply primary and secondary schools with multimedia equipment and simultaneously provide the respective teachers with appropriate training, both initial and continuing, so that full advantage of the installed equipment can be taken;
- b) Support the development of the projects of schools in collaboration with institutions which are specially directed towards this effect, thereby promoting their feasibility and sustainability;
- c) Stimulate and support the creation of educational software and dynamise the editing market;
- d) Promote the introduction and generalisation in the system of information and communication technologies resulting from the dynamics referred to in b) and c), which make it possible to satisfy the needs and which guarantee the development of the educational system;
- e) Promote the dissemination and interchange, both national and international, of information on education, namely through networking and through support to congresses, symposiums, seminars and other scientific and pedagogical meetings.

<i>Teaching level</i>	<i>Number of schools</i>	<i>Number of students</i>	<i>Number of teachers</i>
Kindergarden	3 536	187 605	5 193
Basic education (1st Cycle)	8 883	508 252	31 718
Basic Education (2nd & 3rd Cycles and Secondary	1 664	1 111 899	99 418
Total	14 083	1 807 756	136 329

Table 1: Number of schools, students and teachers by teaching level (DAPP, 1999).

### **INTERNET in Basic Schools**

uARTE, the Educational Telematics Network Support Unit, from the Ministry of Science and Technology supports and promotes telematics activities in schools.

This is partly carried out through a web site, which offers various services that support the development of this programme:

1. news sent in by schools describing their activities;
2. a catalogue of interesting educational resources on the Internet;
3. some forums (news or IRC) where schools may debate issues relating to education;
4. an e-mail and www directory of all schools in the programme;
5. several proposals of national and international projects based on Internet;
6. some guiding materials and a showcase of good examples and best practice.

Part of the educational support is carried out at the local level, through several actions centred on school visits, facilitating the correction of problems, and stimulating the use of the Internet as a library information resource.

### **Conclusions**

All these projects were very important in implementing a national coverage with schools equipped with multimedia computers and Internet connections.

Teachers and students were trained on the use of ICT. They now have the tools and the knowledge to change things. However school initiatives depend on human resources mainly on ICT teachers.

Compulsory projects with the presence of a technician as a teacher with all the schools obliged to present and develop a project concerning the use of ICT demonstrated to be the best solution. It is important the implementation of coherent teacher training courses on ICT and the development of a teaching community to share personal and institutional experiences. Due to the lack of software in Portuguese it is important to underline the contests some of the earlier projects developed and the necessity to carry on with this kind of initiatives.

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