

OECD/CERI ICT PROGRAMME

Case Studies of ICT and School Improvement in Italy

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Giancarlo Marcheggiano, Team Leader

Annamaria Fichera

Marina Mayer

Agostino Roncallo

Palmira Ronchi

Ministry of Education, Italy

Introduction

In the last years a number of important and structural reforms has been affecting the whole Italian system of education.

Some reforms have passed the exam of Parliament and are now effective: first of all, the one concerning autonomy of schools and their self-government concerning both inner organization (timetable, classes, courses) and teaching and learning process.

Further reforms, such as the revision of the present framework of studies, are still under discussion. This reform will clear the way to the set up of national curricula, even if, due to their autonomy, schools already have the possibility of activating specific courses within the framework of national curricula.

According to the reform, the national school system should be made up of two sections, the first lasting 7 years, the latter 5 years. After nursery school pupils aged between 6 and 12 should attend **primary schools**, and move then to **secondary schools** up to the age of 18.

The secondary school should be divided into two stages: a two-year compulsory course, based on a balanced range of subjects that helps them to develop the qualities and skills needed in further education or in training and orientating them to the following studies.

During the three-year course they study more specific subjects, according to the main tracks they have chosen. This final stage of secondary school is articulated in five curricula:

humanities, scientific studies, technical and technological studies, arts and music.

Those who want to get into working life can spend the three-year course attending vocational and professional training as well as apprenticeship.

All curricula allow access to university faculties: there are no limits or compulsory courses. But Universities may autonomously submit allowance to a faculty to an entry examination, in order to assess the students' level of knowledge and abilities acquired during school time.

Information Technologies have been adopted in the Italian school since their appearance, at least experimentally. They are now widespread in secondary schools, especially in Technical and Vocational Schools: these schools have passed through the technological generations, starting from the sixties up to today's multimedia and telecommunications revolution. The situation in nursery, primary and general secondary schools is diversified, since funds have been less systematic and fully dependent on different local situations.

The social, cultural evolution towards the information society has made a school adaptation necessary. It is not only necessary to spread technologies more quickly, but also to make their use possible.

The Ministry of Education has promoted the Programma di Sviluppo delle Tecnologie Didattiche (Development Program of the Teaching Technologies) 1997-2000.

This is a broad scale program that has involved the whole Italian school system, based on a large public investment.

The program has established three important objectives:

- to encourage students to have a good command of multimedia, that is capacity to understand and use the different instruments, but also adoption of new learning methods in the framework of study, survey, communication and planning;
- to improve the effectiveness of the teaching-learning processes and the same teaching organization as far as each subject and acquisition of general skills are concerned;
- to improve teachers professionalism not only through training courses but also giving them instruments and services for their daily work.

Investments have been used not only for furnishing schools with technological resources but also for giving teachers a first chance to be trained to use ICT in their didactics.

At the end of the Program, the minimum ratio PC/students is now 1/50, while the mean value is about 1/30.

All technical, vocational secondary schools are connected to the Internet, while the percentage of general secondary schools is about 90% and in primary and lower secondary schools the percentage is 75%.

About 450,000 teachers have been able to follow training activities.

In the next three years further investments have been foreseen in the framework of infrastructures, so as to have a ratio PC/students equal to 1/15 in primary schools and to 1/10 in secondary schools. Moreover, all schools will be connected to the Internet and a wiring harness will be carried out inside 5,000 schools.

A large investment will be made on training courses for teachers not only by means of generalized actions, but also through special programs aiming at training people with specific

characteristics and duties concerning ICT use in schools.

As far as the presence of a specific teaching in the information technology sphere is concerned, it is necessary to point out that, in the curricula which are now in force in Italy, the teaching of information science as a separate subject is not foreseen, except for some technical, vocational secondary schools. Some information technology concepts and methods are integrated in mathematics curricula.

Actually there is no specific teaching subject regarding information technology and teachers involved in different subjects are assigned to train students in this field.

The introduction of multimedia technologies and the use of different networks have been warmly welcomed in Italy by humanities teachers, rather than by teachers involved in scientific subjects. Even if the staff being expert in ICT use belong to the scientific sector.

In perspective, information technology teaching is expected to be assigned to teachers involved in different fields (that is not in an independent subject) at least up to the end of the first cycle (the first 7 years of school). While the introduction of information science as a specific subject is foreseen in the secondary cycle, in all tracks, but all teachers involved in other subjects go on using ICT.

All reforms which are now affecting the school have brought about fundamental, wide-ranging changes in the administrative secretarial staff work.

To support school administrations in the carrying out of reforms through the use of new technologies, the ministry has set up the Servizio per l'Automazione Informatica e l'Innovazione Tecnologica (Technological Innovation and Information Automation Service) which, in collaboration with EDS, the provider of information services, must support schools in the use of these new instruments.

All the administrative offices of the school system, that is Ministry, Local Administrations, school secretary's offices, are connected via Intranet.

On the whole, the actual period in Italy is particularly rich in innovative ferments concerning not only school experimentation but all the formative system organization, its structure and its courses of studies. The same administrative offices are now the object of a reorganization which should lead to a regionalization of the school management, without prejudice to a direction, assessment and supervision of the central Ministry.

It is clear that ICT have become very important in this picture. And the results of the national policies in the ICT sector have also become evident in the schools involved in this study.

In these case studies, schools have been chosen so as to represent different school levels and territorial areas. These are schools in which technologies are part of the innovative process, even if each of them has its peculiar characteristics.

Rodari Primary School is located in Udine, a small-medium sized provincial capital in north-east Italy. It has been able to profit by the staff engagement, enthusiasm and devotion and, especially, by the school Manager and by the responsible for technologies. This one is an early adopter in the school, being able to draw other colleagues' attention. This school is characterized by an equipment whose instruments are not excellent but they have been used so

as to be an essential, daily element in the work of teachers and students, inside and outside the classes. The involvement of the School in national experimental projects has allowed the school to be furnished with the existing instruments and to train teachers.

The use of technologies is not an end in itself: it becomes deeply integrated in the learning of different subjects. In this case it is difficult to think of coming back. So the Direction undertakes to guarantee the resources required in the future for going on developing the work done by the school in this field.

In Lepido Secondary School located in Reggio Emilia, a small-medium sized provincial capital in Central-Northern Italy, technologies are included in an innovation project in which they do not represent a priority objective. This has allowed a synergical exchange: if, on the one hand, the innovation project has been able to benefit from the great boost due to the introduction of technologies, on the other it has been possible to let a greater number of teachers use technologies according to their interest towards the innovation process now existing in the school, thus integrating curriculum with technologies.

Einstein Industrial Technical Institute of Rome, the capital located in the Centre of Italy, has experienced a process similar to the one described for Lepido School. The variety of projects and experimentation existing in the school, which is always very active and represents the reference point in the territory, has found in the use of technologies a common denominator which has given all school initiatives a new, more unitary meaning. The school tracks and the age of students have probably contributed to give the whole process a more definite characteristic compared to what has occurred in Reggio Emilia.

On the contrary, the Commercial School of Busto Arsizio, located in a town in North-West Italy, near Milan, has exclusive characteristics compared to other cases taken into examination. The school technological equipment is very good and the constant engagement of the school managerial staff has allowed its use to be successful as regards organization and teaching management. The integration of technologies in curricula has turned out to be of a high standard, even if it doesn't seem to affect enough the teaching, methodological innovation. The school Centro di Risorse Multimediali (Centre of Multimedia Resources) is a real prototype-model which all schools should dispose of.

Similarities and differences observed in the four cases under examination lead to a series of reflections, with respect to the survey hypotheses, too.

In all the cases under study technologies act as a catalyst of the innovation process. Even though in Lepido Primary School and in ITIS Einstein the innovation process existed before the integration of technologies.

The observations regarding the second hypothesis are more interesting. In Rodari, Lepido and Einstein schools the spread of the innovation process seems to have followed a course which can be brought back to the one described by Rogers, even if the level of spread reached is perhaps different in the three cases. On the contrary, Tosi is a rather special case. In this school technologies have been introduced so as to automatize some services, so the diffusion process is extremely fast. In fact, the technology introduced in those services is used by everyone. On the contrary, the great availability of equipment doesn't seem to positively affect the innovation process as regards the teaching and learning level.

So the integration of technologies in the school administrative and management system seems to have different characteristics and requirements. The need for a widespread consent is an

essential condition for spreading ICT use in the teaching system. The presence of early adopters who are able to draw other colleagues' attention and interest and to be a reliable point of reference for them is an almost irreplaceable element to assure that the spread of technologies in the teaching process can develop.

The role and presence of teachers are clearly an almost irreplaceable element in the introduction of technologies in the schools under examination. This is true and self-evident in Lepido and Rodari schools because of the students' age, too. But also in Einstein, a secondary school specialized in electronic and telecommunications studies, teachers have a fundamental role in directing the use of technologies to the attainment of the learning objectives concerning different subjects. Tosi's case, in consideration of the greater availability of technologies and of the small number of teachers involved in their use for teaching purposes, should have allowed to point out what was shown in the opposite hypothesis, also on account of the students' age and of the school tracks. It is clear that this was not the case.

The availability of technologies inside schools is in many cases referred to as an opportunity given to students belonging to the less prosperous families and doesn't seem to amplify the differences between students coming from different social classes. The greater or lesser financial condition of families has also been referred to as not decisive compared to the presence of information instruments at home. Once more, in this case, the school seems to play a large part in the use of these instruments, which are often used by students at home for their enjoyable activities.

The role of teachers is still crucial with respect to what has been shown in the fifth and last hypothesis. In all the schools under examination teachers choose or even produce the materials used by students. In the case of Rodari Primary School children can freely surf through the materials chosen by their teachers and made available by Intranet. So, once more, the role of teachers turns out to be important to prevent students from wasting time or using poor-quality materials. If it is true that poor-quality materials can be found on sale or via Internet, it is still true that multimedia products or materials available on the Net can often be more complete, up-to-date and efficacious than the traditional paper ones.