02.4 Education and Training n

02.4.1 Description of the initiatives and actions

More than ever before, education and training represent a future challenge to be faced. A knowledge of information and communication technologies (ICT) is vital both for teachers and pupils, considering the whole of society as pupils. Rather than simply learn technology, it is much more important to learn with technology, learning to be able to use the information and to work in the new environment of the Information Society. Therefore, in this new context, the challenge to be faced is teaching to learn.

Interactivity with the environment and the possibilities offered by both the new content and the network mean that the pupil-teacher relationship is basically "interactive" within a process of mutual enrichment. The traditional role of the teacher as the exclusive transformer of knowledge has become a role of "guide".

There is an urgent need for a training plan for trainers that takes account of the present change, and it is also vital that training should no longer be seen as an activity performed during a specific period of our lives. We should begin to view it as part of day-to-day life.

The essential initiatives that Catalonia on the Network will deploy in the EDUCATION AND TRAINING area focus, on the one hand, on the new role of the trainer, and on the other hand, on the structural change that the education community is undergoing, with respect to its organisation and management, and also to the change/adjustment of curricula to continuous education and training, and to the deployment of infrastructures.
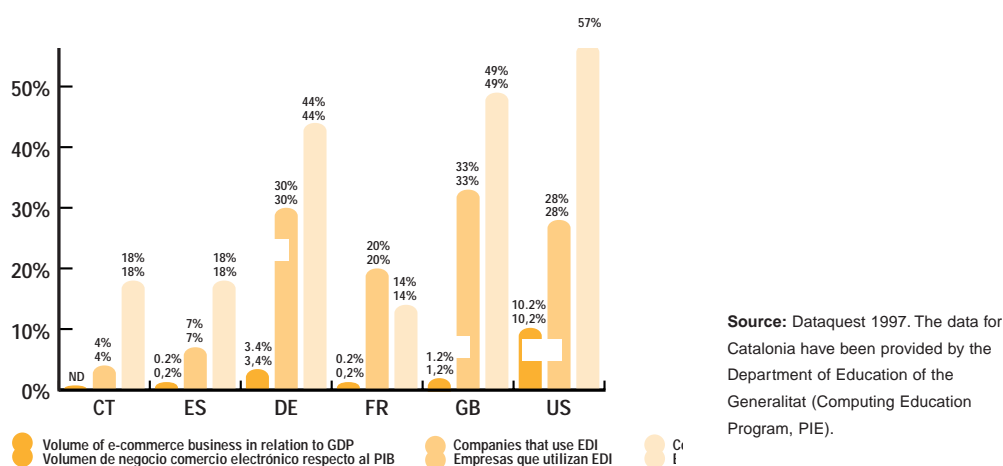

Source: Dataquest 1997. The data for Catalonia have been provided by the Department of Education of the Generalitat (Computing Education Program, PIE).

Volume of e-commerce business in relation to GDP
Volumen de negocio comercio electrónico respecto al PIB

Companies that use EDI
Empresas que utilizan EDI

Figure 5. By September 1999, the Argo project will have equipped Catalan state schools with a further 10,000 computers (to add to the 20,000 already installed). The ratio of 30 pupils/PC will drop to 20 pupils/PC in autumn 1999.

Initiative 1

Introduction of curricula adapted to the needs of the Information Society.

It is necessary to adapt the curriculum in all fields of teaching, reviewing it in the light of the new types of knowledge required by the Information Society, incorporating Information Technologies into the curriculum and highlighting the contributions of these technologies, especially with relation to information procedures. Furthermore, it should be made obligatory for the curricular projects of non-university learning centres to adopt strategies that will guarantee the systematic and progressive incorporation of Information Technologies, as well as equal opportunities for pupils.

Actions:
- Adaptation of state education curricula, phasing in ICT.
- Promotion of the exchange of experiences with the incorporation of "virtual" elements.
- Definition of new educational curricula for both compulsory schooling and higher education.
- New study plans orientated towards the new professional profiles required by the Information Society.
- Training in the creation of multimedia content.

Agents:

Department of Education, **CUR (Commissioner's Office for Universities and Research) / Universities**, INCANOP (Catalan Institute of New Professions), networks of schools, local bodies.

Initiative 2

Initial and continuous training of teaching staff.

The key to the success of the change will lie in the extent to which teachers are conscious of the need to "master" the new technologies, in order that the infrastructure available - network and digital content - is really used and forms a structured part of teaching tasks. This initiative includes new study plans, promotion of interdisciplinary research and a continuous training plan.

The initial training of the present teaching staff and their personal experiences are characteristic of an environment in which the presence of Information and Communication Technologies is limited. This is also applicable to the management teams. In general terms, teaching staff are conscious of the present or potential effect of Information Technologies on their professional activity and struggle against computer illiteracy by participating intensely in permanent training. However, this fact does not automatically lead to the use of technology with the pupils, nor does it guarantee the reconsideration of certain issues relating to the manner in which they perform their work and how their job is to evolve. Nor does training alone guarantee that the changes in the collective mentality of teachers required by continuous educational innovation take place.

In summary, the following actions must create the "change", and they should also serve as encouragement to use Information Technologies on a day-to-day basis.

Actions:
- Introduction into the teacher training study plans of an awareness of the impact of Information and Communication Technologies on specific methodology and the various subjects that are studied.
- Development of a continuous training plan based on the framework of knowledge and skills required, which will first be defined for each educational profile.
- Promotion of interdisciplinary research on Information and Communication Technologies that will integrate people and groups at different levels of the education system.
- Support and encouragement of the participation of groups and centres in joint projects at both national and international levels.
- Creation of a space on the Web for access to materials, information and training tools and self-learning.

The portal or space for access to information materials will make the following available: firstly, didactic units; secondly, particularly relevant world educational resources; thirdly, databases of Catalan educational resources; fourthly, raw material for the creation of other materials, and fifthly, an excellent tool for self-learning.

Agents:

ICEs (Institutes of Educational Sciences), **Department of Education**, **CUR (Commissioner's Office for Universities and Research)**, networks of schools, local entities.

Initiative 3

Programme for adult education and continuous training.

The key to attaining a high level of employment in Catalonia is linked with the skills and expertise of the population. Other countries such as the U.S.A., for example, have placed considerable emphasis on the training of three groups: women, those people who are beginning their professional careers and the group of people who are likely to take early retirement. Continuous training of adults can greatly improve their possibilities of finding a job. This potential for employment is associated with the capacity of the population to understand and use the new Information Technologies. Continuous training in Information Society-related subjects, in accordance with professional specialities, is the best approach to take in order to anticipate the skills that the Information Society will require.

Actions:

- Advantage will be taken of the educational infrastructure, in order to train adults in Information and Communication Technologies with a view to incorporating them into the Information Society.
- Promotion of continuous training in business and employment environments by means of the new technologies.
- Creation of new professional profiles and retraining of existing profiles for conventional professions.
- Specific training for groups with special needs and for the elderly.

Elderly people as a group will have an important part to play in the new society, and therefore this initiative will consolidate the commitment already made to educating the elderly in the new technologies.

Agents:

Department of Social Welfare, **Department of Labour**, universities, private entities, CSI, local entities.

Initiative 4

Creation and exchange of educational materials: a virtual market.

The policy of deployment of infrastructures must be accompanied by the development of pedagogic content. Part of the strategy consists in paving the way for the emergence of an educational multimedia and audiovisual industry that will motivate and at the same time provide support for educational practices. There is a shortage of multimedia products that are well-adapted to the cognitive process of pupils, the organisation of the class and curricular subjects. Within education in Catalonia, the task must therefore be undertaken of developing a multimedia (or audiovisual) product concept that has been adapted to these new needs. In this respect, a variety of actions will be necessary, whereby teachers may participate temporarily or definitively in the private structures of the publishing world. The virtual market is an area for the exchange of didactic material to which teachers and businesses have access and where they may deposit material (content broker).

It is necessary to promote the use of digital resources for collective communication and information in all teaching centres, and it is also important to establish and maintain logical infrastructures of access to and creation of digital content. In particular, there is a need to foster internal and external management of information that is "as paper-free as possible".

In general, this initiative will boost the creation and exchange of didactic materials. Therefore, as well as being a consolidating tool and an important one for all, most importantly it will provide a point of access for rural areas.

Actions:
- Establishment of a content digitisation programme.
- Creation of new multimedia materials.
- Incorporation into educational broker (llotja) of all the organisations and groups involved in the creation of telelearning, "edutainment", "documentalism" and digital press.
- Association of foundations, publishing companies in the educational sector, companies from the audiovisual sector and platforms of operators for the joint creation of didactic materials.
- Organisation and presentation of the educational offer to be found on the virtual market.
- Integration of content from libraries as an important part of the virtual market.
- Interaction between the multimedia learning material research centres and the educational network on the one hand, and the virtual market on the other.

Agents:

Department of Education, **CUR (Commissioner's Office for Universities and Research)**, audiovisual/multimedia sector, private publishing sector.

Initiative 5

Promotion of organisational and structural change in education centres and deployment of the virtual community formed by these centres.

Information Technologies inevitably bring about changes in the structure of organisations, operational regulations and methods of production. Likewise, they modify the role of people and make it necessary to redefine relations with clients and with the environment in general. If these considerations are applied to the area of education, it may be said that in order to integrate Information Technologies into the education system, leaving the infrastructures aside, it is not sufficient to organise the training of the teaching staff and to increase the availability of new content, factors that have been given priority to date. In order to integrate Information Technologies into education, it is essential that considerable emphasis is also placed on the organisation and management of teaching centres.

Therefore, it is necessary to establish suitable measures, so that the incorporation of Information Technologies into the curriculum and the curricular planning of each teaching centre may take place by means of flexible organisational formulas. In order to ensure that the change is successful, it is necessary to include the management of the technology among the series of tasks that fall to the responsibility of the management teams of the teaching centres, while plans must also be made with respect to the economic allocation required and the personnel needed to operate the physical and logical infrastructures of these centres. Furthermore, it is necessary to establish a framework for specific competence in Information Technology for the entire active teaching staff, obligatorily extending this to the students of the education faculties and the teaching profession entrance exams.

Another factor that affects the attitudes of the teaching staff is determined by the valuation in economic and career terms (transfer exams, study leave, public entrance examinations, etc.) of the activities that the teaching staff perform or can claim they perform in the area of Information Technologies (co-ordination of computing in teaching centres, permanent training in information technology, development of computing applications,

co-ordination of experiences, etc.).

Moreover, there is a need to establish measures concerning school architecture that guarantee the physical presence of broadband wiring in the majority of teaching centre buildings and the safe electrical connection of a large number of computers. Further guarantees must be given that the future construction and refurbishment of buildings will provide areas or facilities where Information Technologies can be intensively used for work in projects and in groups.

It is necessary to make budgetary and organisational forecasts for a continuous deployment of technological infrastructure in the teaching centres, covering both new investments and maintenance. In this way, while guaranteeing the minimum equipment that is essential, each centre can have the financial and human resources in accordance with its projects and the corresponding accreditation of results.

The use of virtual spaces (virtual campuses or schools) will be one of the future changes that will reinforce the interaction of pupils with remote resources and multicultural communities.

Actions:
- Incorporation of ICT into the educational project of the centres, in such a way that systematic and progressive globalisation is guaranteed as an institutional objective at the different levels of conception, management and execution.
- Integration of ICT (equipment, connectivity, networks) into the design and construction projects of the education centres (connectivity in the classroom).
- Inclusion among the criteria by which teaching staff are recognised and promoted of endeavours in innovation and institutional development through the promotion and application of ICT to educational activities.
- Fostering at various educational levels of the potential to be derived from the use of virtual spaces and campuses.
- Creation of basic multidisciplinary teams and technical and pedagogic support for (regional) areas of education.
- Reinforcement of the capacity of ICT for integrating various special needs groups, with a view to facilitating their access to the education system.

Agents:
Department of Education, **CUR (Commissioner's Office for Universities and Research) / Universities**, networks of schools, private entities, local entities.

Initiative 6

Plan to provide Infrastructures.

Within a very short period of time, computers will form part of the standard school furnishings and they will become integrated into the classroom, serving as a multimedia blackboard; the classroom will therefore have both a magisterial and an interactive ingredient. The pupil/computer ratio in schools will have to decrease, and the aim will be to reach a ratio of 10 pupils per computer within the next four years. Other important aspects of this change relate to the architectural infrastructure of the school and access to Internet. The architectural, technical and communications infrastructure of the teaching centres will have to evolve considerably, in order to make new working and organisational dynamics possible.

Actions:

- Provision of an equipment and connectivity plan for public centres that will give all education centres access to virtual, documentary and training services, progressively increasing their connection speed until certain broadband standards are reached.
- Allocation of an electronic mail address and, possibly, a presence on the Web (Web pages) for the entire community of education centres.

Agents:

Department of Education, CUR (Commissioner's Office for Universities and Research) / Universities, networks of schools, private entities.

02.4.2 Chart summarising the initiatives and actions

INITIATIVES	ACTIONS	AGENTS
Initiative 1 Introduction of curricula adapted to the needs of the Information Society	• Adaptation of state educational curricula, phasing in ICT. • Promotion of the exchange of experiences with the incorporation of "virtual" elements. • Definition of new educational curricula for both compulsory schooling and higher education. • New study plans orientated towards the new professional profiles required by the Information Society. • Training in the creation of multimedia content.	**Department of Education** **CUR / Universitie** INCANOP Networks of schools Local entities
Initiative 2 Initial and continuous training of teaching staff	• Introduction into the teacher training study plans of an awareness of the impact of ICT on specific methodology and the various subjects that are studied. • Development of a continuous training plan based on the framework of knowledge and skills required, which will first be defined for each educational profile. • Promotion of interdisciplinary research that will integrate groups at different levels of the educational system. • Support and encouragement of the participation of groups and centres in joint projects at both national and international levels. • Creation of a space on the Web for access to materials, information and training tools and self-learning.	**Department of Education** **ICEs** **CUR / Universities** Networks of schools Local entities
Initiative 3 Programme for adult education and continuous training	• Advantage will be taken of the educational infrastructure, in order to train adults in ICT with a view to incorporating them into the Information Society. • Promotion of continuous training in business and employment environments by means of the new technologies. • Creation of new professional profiles and retraining of existing profiles for conventional professions. • Training of groups with special needs.	**Department of Social Welfare** **Department of Labour** Universities Private entities CSI Local entities

Initiative 4

Creation and exchange of educational materials: a virtual market

- Establishment of a content digitisation programme.
- Creation of new multimedia materials.
- Incorporation into educational broker of all the organisations and groups involved in the creation of telelearning, "edutainment", "documentalism" and digital press.
- Association of foundations, publishing companies in the educational sector, companies from the audiovisual sector and platforms of operators for the joint creation of didactic materials.
- Organisation and presentation of the educational offer to be found on the virtual market.
- Integration of content from libraries as an important part of the virtual market.
- Interaction between the multimedia learning material research centres and the educational network on the one hand, and the virtual market on the other.

**Department of Education
CUR / Universities**
Audiovisual/multimedia sector
Private publishing sector

Initiative 5

Promotion of organisational and structural change in education centres and deployment of the virtual community formed by these centres

- Incorporation of ICT into the educational project of the centres, in such a way that systematic and progressive globalisation is guaranteed as an institutional objective at the different levels of conception, management and execution.
- Integration of ICT (equipment, connectivity, networks) into the design and construction projects of education centres (connectivity in the classroom).
- Inclusion among the criteria by which teaching staff are recognised and promoted of endeavours in innovation and institutional development, through the promotion and application of ICT to educational activities.
- Fostering at various educational levels of the potential to be derived from the use of virtual spaces and campuses.
- Creation of basic multidisciplinary teams and technical and pedagogic support for (regional) areas of education.
- Reinforcement of the capacity of ICT for integrating various special needs groups, with a view to facilitating their access to the education system.

**Department of Education
CUR/Universities**
Networks of schools
Private entities
Local entities

Initiative 6

Plan to provide Infrastructures

- Provision of an equipment and connectivity plan for public centres that will give all education centres access to virtual, documentary and training services, progressively increasing their connection speed until certain broadband standards are reached.
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**Department of Education
CUR/Universities**
Networks of schools
Private entities

02.4.3 Co-ordinator, moderators and members

Co-ordinator

Mr. Gabriel Ferrater Pascual — Open University of Catalonia (UOC)

Moderators

Mr. Ferran Ruiz Tarragó — Education Department (PIE)
Ms. Montserrat Llinés Soler — Autonomous University of Barcelona (UAB)

Ms. Iva Alguera	ABC (Newspaper)
Mr. Virgilio Aranda Rodrigo	University of Lleida (UdL)
Mr. Ramon Barlam	IES Llobregat
Mr. Manuel Blascoi Legaz	Municipal Institute of Education
Mr. Ramon Cemeli	ACTE (Rosa Sensat Organisation)
Mr. Josep Antoni Delgado Rivera	Catalan Institute of New Professions (INCANOP)
Mr. Joan Domènech	Federation of Pedagogic Renovation Movements
Mr. Jordi Fernàndez	CEAC
Mr. Juan Carlos Gallego Herrera	Comisiones Obreras (CCOO) (Spanish workers' union)
Mr. Manuel Hurtado Barrero	OffCampus
Mr. Francesc Labastida Azemar	Institute of Architects
Mr. Antoni Manyé Martínez	Education Services
Mr. Enric Marco Batlle	Catalan Federation of Parents
Ms. Imma Marín Santiago	Federation of Children's Play-centres
Mr. Miquel Martí Solé	UNESCO
Mr. Josep Martí Roca	La Salle Bonanova
Ms. Maria Mirabet Vallhonesta	Catalan Institute of Technology (ICT)
Mr. Josep Ma. Monguet	Polytechnical University of Catalonia (UPC)
Mr. Juli Palou Sangrà	Department of Language and Literature Education
Mr. Martí Parellada Sabata	Palau de les Heures Vall d'Hebron (Univ. of Barcelona)
Mr. Xavier Ritort Ferran	DOXA Consulting
Mr. José Luis Rodríguez Illera	Institute of Educational Sciences (ICE, UB)
Ms. Blanca Rosa Roca	Zeta Group (Publishing group)
Mr. Jaume Sarramona López	Catalan School Council
Mr. Jaume Teodoro Sadurní	Polytechnical University School of Mataró
Ms. Roser Torres	ACAE
Mr. Antoni Tort Bardolet	University of Vic
Mr. Joan Triadú Carré	ROSA SENSAT
Mr. Miquel Trilla de Bruguera	Catalan Association of Municipalities (ACM)
Mr. Jordi Vivancos Martí	Department of Education (PIE – Educational Computing Programme)