Cap sur l'école inclusive en Europe

Erasmus+

Resource sheet

Computer technologies and school inclusion: What design for a difference in value?

Section D/Training module

1/ Report: applications for computer technology in teaching (the field of computer science applied to schools and education); computer technologies and school inclusion.

2 / Approach – demonstration

This research is part of studies concerning applications for computer technology in teaching. It places particular emphasis on the possibilities that tools and languages offer to breaking down barriers to learning, and enhancing differences: the unconditional and non-exclusive accessibility of educational materials and contexts is the pivotal theme of this work. When we examine the field of computer science applied to schools and education, contact between different disciplines is as inevitable as it is challenging: any work that sets out to consider potential uses and meanings of IT tools requires an interdisciplinary approach which combines humanities and social sciences with information and communication sciences.

"What is the best approach for enhancing differences?"

I used this question to start piecing together the current situation, using literature published on the subject both in Italy and abroad. My aim was to investigate approaches and imagine proposals, including those of an operational nature, for creating digital teaching materials that take the differences of each and every individual into account. The research actually starts with the assumption that ICTs and multimedia languages are flexible tools that will reduce learning barriers in education, provided they are used with an end to enhancing differences. Particular emphasis is placed on the opportunities offered by digital textbooks, which are considered a tool for overcoming accessibility limitations posed by printed books. The Italian scientific literature on the subject is relatively undeveloped in respect of this approach to technology, as opposed to the way they are currently perceived in teaching. On an international level, however, it is more common to find interpretations of accessibility in a broader sense that go beyond merely applying design standards, even in the field of ICT.

The role of technology in integration policies

For several years, Information and Communication Technologies (ICTs) have become part of our everyday lives, as well as becoming life projects for people with disabilities, particularly in education and training contexts. ICTs have in fact provided high technology solutions that extend the possibilities offered by Assistive Technologies (AT) to develop autonomy . In the school environment, appropriately selected

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hardware and software aids can foster the participation of disabled pupils in learning processes, making it possible to remove access barriers that increase the gap between them and their classmates. As Marisa Pavone points out, using disability technologies in educational contexts touches on issues concerning teaching methodology and technical issues regarding the choice of devices at the same time. By definition, ICTs have strengths in at least three areas, namely "motivation, precision and adaptability" . In fact, the flexibility of computers means that those using them can customise training processes, catering to the styles and the pace of learning of the individual . All European countries have adopted policies for introducing ICTs in education and training, recognizing them as useful tools to promote pupil creativity whilst renewing teaching practices . In addition, the European Commission views ICTs as a tool for supporting teachers in the difficult task of customising learning, fostering cooperation in teaching and promoting autonomy and skill development. This also applies in extremely heterogeneous contexts and where there are pupils with special needs : according to experts, "inclusive education" provides an important basis for ensuring equal opportunities for people with special needs in all aspects of their lives; (It) requires flexible education systems that can meet the different and often complex needs of individual students. The types of approaches in classes that support inclusion of students with "special" needs include cooperative teaching, cooperative learning, problem solving through co-operation and heterogeneous groups; systematic monitoring and evaluation, scheduling and evaluation of each pupil's work. Such strategies can be beneficial to all students, even those who are particularly well-equipped. Initiatives for including children with "special" educational needs can therefore be considered an extension of the principle that the school should be built around the particular needs of each pupil. [...] demands made of teachers are increasingly challenging: they work with student groups that are far more heterogeneous than before (in terms of mother tongue, gender, ethnicity, faith, ability, etc.); teachers are required to take advantage of the opportunities offered by new technologies, to meet the demand for personalized teaching and to help pupils become autonomous in lifelong learning. [...] Information and communication technologies have tremendous potential to support autonomous learning, collaborative knowledge building and skill development .
The dossier published in 2011 by the Education, Audiovisual and Culture Executive Agency provides a list of European countries that have issued recommendations at central level concerning the use of ICT as a tool to promote equality in education, for different types of pupils: in the Czech Republic, Germany, Greece, France, Austria, Iceland, Latvia and Portugal the reference is to pupils with disabilities and learning difficulties. In Estonia and Slovakia, pupils with disabilities
add to the socio-cultural disadvantages; in Belgium, Denmark, Ireland, Spain, Italy, Hungary, Malta, Poland, Slovenia, Finland and the UK, the use of ICT is promoted in ordinary education to support disabled, those with social and cultural disadvantages, and those with learning difficulties. No indications are recorded at central level in Bulgaria, Cyprus, Lithuania, Luxembourg, the Netherlands, Romania, Sweden, Scotland, Norway and Turkey.

Figure 1: Recommendations / suggestions on ICT use to promote equality in primary and secondary education, 2009/10. Source: EACEA – Eurydice

The more detailed European Report on the use of ICT in Disability Education Policies dates back to 2004 and identifies five key areas for making measures effective: suitable infrastructure (hardware, software, Internet access), technical support, training, research and evaluation . In most European countries (Austria, Belgium, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden and the United Kingdom), National ICT policies include objectives in all five areas of interest. Likewise, most countries share the principle that appropriate ICT use can reduce inequality and support school integration. Where the principles are shared, weaknesses are found in limited availability of hardware and software resources, but above all in a lack of specialized training for teachers or disparities in potential for expert assistance when needed. In research terms, there is a lack of applied studies.
The European report continues with an analysis of teacher training in ICT and special education. In many countries, including Italy, there is a general introduction to the use of teaching technology, both in initial and

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on-service training. It seems that only countries such as Austria, Denmark, France, Germany, Greece, Ireland, Lithuania, Spain, Sweden and the United Kingdom adopt specialized training for using ICT to cope with special educational needs. Training is itself the issued at hand for a conscious introduction of technologies. In fact, it is evident that the availability of good materials and adequate infrastructure in schools does not guarantee they will actually be used. Problems emerge concerning substandard preparation of teachers in most European countries, with a uniform situation among countries that adopt separatist or inclusive policies. Poor cooperation between professionals and the lack of good shared practices seem to place a brake on the actual use of technology in special education. There is, however, a clear awareness of the need to develop practices based on educational theories that provide a pedagogical framework for using the tool. This awareness involves training opportunities for teachers and more specific national policies on the subject.
In 2001, the education and training priorities for teachers were shared by the European Parliament with the eLearning Action Plan. The program invites Member States to "persevere in efforts to effectively integrate Information and Communication Technologies in Education and Training Systems" and "fully exploit the potential of the Internet, multimedia environments and virtual learning for better and better Quicker achievements of lifelong learning": through cooperative learning and e-learning tools, the goal being to overcome the digital divide, to foster lifelong learning and to establish a European society of knowledge . The following year, the National Information Technology and Communication Education (ForTIC) Teacher Training Plan was launched, with the involvement of one hundred and eighty thousand teachers and training activities with a blended approach. The course was organized in ten modules, chosen by fourteen students, and aimed at acquiring technical skills (according to the European Computer Driving License (ECDL) program) and knowledge of new technologies in didactics . For years after there was no real national plan, but rather a community development of practices that, in various teacher training topics, exploited network technologies to spread knowledge. Through the Puntoedu environment by Indire , trained teachers have synchronous and asynchronous communication tools to learn according to a cooperative model . The 2005/2006 academic year also saw the addition of a series of training initiatives and technology facilities at regional level95. To date, the National Agency for the Development of School Autonomy and the MIUR are promoting national projects that go under the name of "Digital School" :
- The Digital School Project - LIM is a State-level curriculum for the provision of Interactive Multidisciplinary Interfaces in Classes. At the same time, there is a training course for the didactic use of the instrument, organized according to school level: two for secondary grade I in the 2009/2010 and 2011/2012 academic years, and two for secondary and high school children for 2010/2011 and 2011/2012;
- The Scuola Digitale project - Cl @ ssi 2.0, which has corresponding projects in Spain and England , was devised with the aim of evaluating the effective integration of technologies in school contexts, shifting focus from mere endowment to technology effectiveness in changing contexts and learning processes.
By supporting experimentation that introduces technology into classes to tests teaching tools and methods, action models for replicating within school networks are created;
- The Digital School Project - Digital School Publishing aims to stimulate cooperation between publishing and the world of the school to achieve the proposal of twenty prototypes of digital school editions. The editions will have to systematize the potential offered by new technologies with the traditional ways of transmitting knowledge, based on MIUR guidelines. The briefly outlined framework covers the general national programs for developing teaching technology. For projects devoted specifically to the integration of disabled pupils through the use of technologies, it was necessary to wait for the 2005 New Technology and Disability Project (NTD), which was established with an agreement between MIUR and the Ministry of Technology Innovation.

Among the opportunities offered by the technology, we are interested in:
- the ability to create personalized teaching materials for students in situations of severe disability;
- increased self-esteem;
- providing a response to the need for flexible and shared tools;
- customizing content to facilitate learning;
- the ability to ensure texts go from being "unworkable" to easily executable;
- facilitating teaching activities which require writing;

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- the possibility to ensure perfect integration of deaf or pupils with low linguistic skills in Italian, with hearing-minded peers (multimedia);
- the opportunity for disabled children to develop cognitive skills and cultural knowledge;
- the ability to equip schools with a small digital library that complements existing traditional school libraries;
- pedagogical reflection on new technologies and teaching experience in research-action projects;
- work linking teachers with schooling experts and the university sphere.

The technical opportunities provided by the products include:
- the broad usability of the screen reader Jaws with the Italian version;
- the production of accessible texts in XHTML and DAISY by non-expert users;
- the ability to use DAISY format even on smartphones.

It is to be said that use of ICTs, owing to the emotional involvement of students using them in the school environment (think of interactivity of hypermedial environments, imminent simulations, and possible exchanges between peers using the instrument), can at the same time promote rational and emotional approaches to knowledge, spontaneously raising knowledge levels. By encouraging metacognitive processes, the technology allows the student to reflect on learning phases, harnessing emotions to positive effect and developing creativity thanks to the flexibility of a medium whose products - if suitably designed – can always be edited, and are never definitive .

Teachers are not only required to know how to use the instrument, but also to embrace a truly "digital culture" that allows them to govern the medium (with its languages). The aim is to guide them towards reformulating the way their discipline has been taught over the years.

They are given the task of acting as a guide, facilitator, director (the terms found in literature are varied) of knowledge, within a teacher-pupil relationship which while broadly maintaining the traditionally vertical nature of schools, can at times give way to exchanges of a horizontal nature.

At this point, the main function of teachers is no longer to disseminate knowledge, which is now more effectively carried out by other means. Their skill must shift and become a provocation to learn and think. Teachers become the driving force behind the collective intelligence of the groups they are responsible for. Their work must focus on assistance and managing learning, encouraging pupils to exchange knowledge, providing relational and symbolic mediation and personalized guidance in learning processes.

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