5. Conclusion

In today's technology-driven world, more students than ever before should become familiar with the basic concepts, reasoning, and critical thinking of science. Unfortunately, all evidence points to the fact that students learn less than we intend them to and that bringing about conceptual change requires the introduction of new teaching (and learning) habits. We therefore developed Phys4All, a learning model and learningware based on the judicious use of ICT. Great emphasis has been put on the design and development of ICT-based media consisting of non-linear hypertext, Physlets, laboratory simulations, tests, FAQ and e-mail communication as a solid basis for research on student's understanding of physics and the use of new technologies for teaching and learning. Phys4All has been in development for three academic years and has been extensively tested in a large classroom setting and evaluated through a number of surveys. While most of the data have been collected using the authors' students as a test group, Phys4All is also being used by lecturers at other universities, not connected in any way with the development of the Phys4All project.

Students' use of Phys4All has been monitored and analyzed using Web server log data [Burton, 2001]. These data, together with results from surveys and interviews show that students clearly realize Phys4All offers a lot more than just "another course on a website" or a collection of tools, and they appreciate the added value. Test and examination results for the Quantum Physics course have significantly improved since the introduction of Phys4All. The overall outlook is therefore very positive, indicating that a judicious explicit integration of the use of new technologies can greatly benefit students as well as lecturers.

The database structure set up for Phys4All provides a generic instrument, adaptable to all physics courses, or even all science courses and to each lecturer's preference. As a learning environment tool, it is easily transferable as proven recently by colleagues from the Department of Mathematics who used our Phys4All learningware template to produce a new Web-based course for discrete mathematics in a very short time (http://cage.rug.ac.be/~vo/DiscreteWiskunde/NIVEAU2). Moreover, recently this mathematics course has been smoothly integrated into a Blackboard (http://www.blackboard.com/) environment, proving its is future proof.

Because by law the teaching language of Ghent University is Dutch, most of the material is - perhaps unfortunately for wider distribution - in that language. Nevertheless, anybody interested in using this material for educational purposes is invited to contact the authors for further information.

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37 Dschola – a Regional School Network

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Abstract

Dschola is a regional project (set up in Piedmont, Italy) aimed at stimulating greater attention to ICT, by involving students, teachers and families in partnership with schools. It involves 2.828 educational structures and 50.000 teachers.

The Dschola school network consists at the moment in 18 excellence technical secondary schools and 5 excellence didactical schools, reference points for technological issues in their regional area and with proven experience within the ICT area.

Dschola aims to:

- Create and stimulate a virtual community of schools through the official Web site http://www.dschola.it

- Improve the excellence of the Centres of Service, Animation and Experimentation through experimentation activities

- Stimulate and sustain the training between teachers

- Enhance and improve the cooperation between the Centres and their territorial schools, as suggested by the slogan of the project: "Schools for schools"

- Stimulate and enhance schools' business skills and capacities in order to co-fund their own projects.

Keywords: network, ICT skills dissemination, cooperative work.

1. Introduction

Dschola is a regional project (set up in Piedmont, in the North West of Italy) started in January, 2001. It is aimed at stimulating greater attention to ICT, by involving students, teachers and families in partnership with schools.

The Dschola network consists of a selected group of primary and secondary schools, with proven technical and didactical excellence at regional level. Those schools disseminate their experiences and expertise towards all the schools in the region.

It is part of an experimentation directed towards the creation of the Regional Network of Piedmont School. It was set up by the Italian Education Ministry, Local Public Administrations and Universities. It involves 2.828 educational structures and about 50.000 teachers.

This three-year project (2000-2003) is totally financed by Fondazione Cassa di Risparmio di Torino, a Bank foundation that invested 21 millions of Euro and made the project possible.

The experimentation for the Regional Network of Piedmont Schools is articulated on three main action lines, that are coordinated with each other, in order to stimulate school and citizens to take part and understand the changes caused by the development of the Information Society.

CO-FINANCING OF ICT-BASED PROJECTS A "Call for proposal" was published in 2001 and a second call was published in spring 2002.

CONNECTIVITY WITHIN THE PIEDMONT GOVERNMENT NETWORK (The so-called "Universal Access"). Services are provided for every public and private school in Piedmont and include: safe and certified network communications, mail boxes, high speed Internet access for management, administrative and educational purposes, information systems and hosting for school web sites (free of charge for maintenance and connectivity), community resources, long-distance support and training activities.

CREATION OF SERVICE, ANIMATION AND EXPERIMENTATION CENTRES (The so-called Dschola project). Starting from their proven experience in ICT, a group of 18 secondary schools set up the required technical and organizational structures in order to become technological reference points in their local area. They are working hand-in-hand with the new school organization and process of gradual school-autonomy. Besides of these, 5 primary schools, with proven experience in didactics and educational methodologies, are in charge of organizing and fostering workshops, seminaries and conferences, in order to disseminate their own competencies.

More specifically, Dschola will support the gradual autonomy process within schools. It is geared to improve educational and organizational flexibility, to increase the responsibility of those who live and work in the school environment, and

finally, to assure compatibility and integration between all didactic choices and initiatives.

The project is in continuous evolution and the number of involved schools could increase in time.

2. Project objectives and operational model

The Dschola project is developed through a collaborative work structure among different players, all working at distance in a shared, cooperative and interactive use of ICT and multimedia, and sharing the aim of improving educational, training and experimental services through ICT. The Dschola project key actors are:

- teachers with ICT, technical and administrative skills

- schools with a good technical background and infrastructure interested in improving and enhancing their competencies and skills towards ICT use in educational field and in new economy.

Dschola policy concern is directed towards building and expanding opportunities for skill acquisition, and applying technological innovation towards didactics or organizational management. Such strategies include:

- The creation of closer synergies between ICT and education

- The creation of closer synergies between schools, and between schools and their territory

- The wider distribution of educational opportunities over the Internet

- The transferability and reproducibility of the model in other regions

The project has followed an innovative operational model that merges a top-down with a bottom-up approach. The top-down approach sets up a very general objective: overcoming digital divide in schools and in the educational field as a whole and promoting a conscious use of ICT.

Nevertheless, the project provides to schools a framework to promote and enhance bottom-up initiatives, idea, expertise. In fact, Dschola wants not only to stimulate and accelerate the use of ICT amongst the educational community, but also to increase flexible learning and distance working and cooperation activities. On the other hand, and for the most, Dschola aims to:

- Stimulate, sustain and improve the cooperation between the Centres of Service, Animation and Experimentation and their territorial schools, as suggested by the slogan of the project: "Schools for schools"
- Create and stimulate a virtual community of schools through the official Web site http://www.dschola.it

- Improve the excellence of the Centres of Service, Animation and Experimentation

- Stimulate, sustain and improve the training between teachers

- Stimulate and enhance schools' business skills and capacities in order to co-fund their projects.

The different topics (namely Learning and training, Innovation and technology transfer policies, Regional aspects and ICT) and actors (namely, Technical and administration secondary school teachers, Educational establishments, local Centres of expertise, Public bodies) involved in the project propose a model for the implementation of the ICT use in the educational field, founded on highlighting best practice experiences, customizing the use of ICT knowledge and technical innovation, providing a training model in which teachers' skills and competencies are used and improved, considering these three features of professional practice:

- an already presence of good quality technical infrastructure

- human and technical resources that are available for generating new knowledge

- the context in which skills are deployed

3. Key-actors and key-actions

The Dschola school network consists in:

- 18 excellence technical secondary schools, having proven experience within the ICT area.

- 5 primary excellence schools, with proven experience in didactics and educational methodologies.

Furthermore, those schools are reference points for the analysis and production of innovation in education and schooling and can contribute to the development of innovative methods, systems and content.

Schools are connected with a broadband network allowing high level multimedia, cooperative activities and good quality videoconferences.

3.1. Services provided by the Centres

a. Training activities

Each Service, Animation and Experimentation Centre provides both direct and indirect training, consultation and support for schools within its own territory. In particular, the first experience of training involved about 1700 people (principals and their assistants) in a short time, between September and December 2001.

The training activities consist of courses for principals and assistants concerning:

- Surfing the Internet

- Using electronic mail and digital certificates

- Connection to the Piedmont Government Network

b. Support activities for projects co-financed by Fondazione Cassa di Risparmio di Torino

Service, Animation and Experimentation Centres are committed to providing general support for these projects. This support is qualified and detailed following the approval of the presented projects and based on the technical aspects of each project.

In particular, in the period July - December 2001 the Centres supported 145 actions to schools running ICT-based projects, for a total amount of more than 2570 hours of consulting.

c. Support and demonstration activities

The Service, Animation and Experimentation Centres, in conjunction with the activities of the schools in any given territory, are dedicated to providing the tools to enable:

Video conferencing services

Activity and event distribution services in real time

3.2. Animation activities promoted by the Centres

Service, Animation and Experimentation Centres arrange the planning and setting up of meetings and conferences concerning the main aspects of the introduction and use of ICT. These training meetings will supply a comprehensive reference framework for both organization and technology. For example, the sessions will include conferences and meetings based on the following themes:

- Designing and running a website

- Running and maintaining the school's equipment

- Designing and running security solutions

- Designing and developing multimedia services.

Animation Centres arrange the planning and setting up of meetings and conferences concerning the best practices developed by each Centre. The sessions will include conferences and meetings based on the following themes:

- Disability

- Language

- Microrobotics

- Didactics and network technologies

- Hypermedia

In particular, the Centres provided 50 animation activities (namely training meetings, conferences and seminaries) for a total participation of more than 1730 people.

3.3. Experimentation activities provided by the Centres

The setting up of testing activities as innovative services is planned in each Centre (based on past experience, commitment and projects). These include organizational procedures and services made possible by ICT technology. For example, the experimentation projects consist of the following:

- Production of multimedia educational material

- Multimedia educational material for disadvantaged students

- Video-conference training

- Web-based applications for administrative and educational management

- Wireless connection between schools and Local Bodies

4. Web site of the project

www.dschola.it is the official Web site of the Centres of Service, Animation and Experimentation community. The Web site is the virtual meeting point of the Dschola community, interested in the topics regarding the relation between school and ICT. In particular, the Web site intends to

- disseminate and promote the community activities (Animation, Service and Experimentation) and initiatives

- to exchange within the community material, experiences, acquaintance, information.

The Web site is in fact organized in thematic sections, not only focused on the Dschola Project, the Centres of Service, Animation and Experimentation and their activities, but also in order to provide information on school and ICT and community services.

The web site provides community services, as forums, mail hosting, download area, mailing lists. Furthermore, the community receives a selection of newsletters concerning press release on ICT topics, focus on European Commission initiatives and projects, news about the Dschola project and actors.

The Italian version of Dschola is managed by all the members of the community. They can enrich the Web site publishing news, comments, events, upload of material.

At the present time the web site is available in Italian, English and Spanish. Soon the web site will be available also in French.

Moreover, the site in based upon an open source platform (PHP Nuke) that allows direct contribution by the readers and the community members.

In order to make the community wider, the web site is developed according to the rules of the accessibility, and has passed the Bobby and the 508 validation.

The official web site of the project, published in April 2001, has raised its access fivefold in one year and the accesses and community members are constantly increasing in number.

5. Future developments

In its first running period, the project has focused on the service, animation and experimentation activities of the Centres, with particular attention on teacher training and on the optimisation of the technical infrastructure of the network.

For the next running period, the project activities will more incisively focus on the active participation of students in all the managed activities.

Furthermore, for the next year will be followed an action line based upon the creation of thematic regional labs, organised in networks of schools, on e-learning topics. Those consortiums will also attend to the experimentation of technological solutions towards other schools, aiming to support them and enhance their infrastructure and skills.

To conclude, as didactical and technological reference points for all the schools in the region, the Centres are more and more asserting themselves in the regional territory, being acknowledged as institutional service structures for the Italian Education Ministry