# TEACHING WITH ICT
# EXPERIENCE OF TEACHER TRAINING

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**Abstract**

This paper presents the research and professional development results carried out by teachers on the use of educational technologies in the classroom. The training course was designed as an integrated model of presence (laboratory) and online activities and focuses on the use of LCMS Moodle as a resource for achieving a deeper interaction with both the institutions involved in the projects and with students (and their families) as well as for supporting and disseminating the educational activities carried out in the classroom, with an online environment that would enable the exchange, the interaction and sharing of the study content.

## Introduction and Background

This paper presents a research and a training as a professional development course destined to teachers on the use of modern technologies in the schooling process. These initiatives were carried out in cooperation with the teachers of six classes of Junior High Schools whose seat is in Umbria. They participated in a national project called Cl@ssi 2.0 which began during the 2009–2010 year (www.scuola-digitale.it/classi2.0). At present (2010–2011 year) the concerned classes are also involved in the PoliCultura and Moodle format contained in Learning4All, a part of a national project financed by the FIRB (www.learningforall.it).

The teacher professional development should be planned as a form of life-long learning and promote the possibility of matching different educational methods. From this point of view, the concept of education is to be changed: the traditional model, mainly transmissive and repetitive, characterised by a limited capacity of motivating and involving teachers in their work (Cerini, 2000) is to be overcome, while a model based on social constructivism, guiding adults' education, is to be preferred. Having said that, knowledge is the result of an active and conscious activity carried on by a subject, availing himself of forms of cooperation and social negotiation. He can also create new knowledge, because the learning subject knows, controls his own learning methods and is able to add the acquired knowledge into his conceptual scheme (Jonassen, 1994). Therefore, a deeper ICT and e-learning-based culture is to be promoted, being aware that it will not substitute the relations existing in the classroom, but rather match them with the

online ones. ICT allow indeed more participating and cooperative activities difficult to be carried out in the classroom only. ICT allows for a self-assessment process at the same time knowledge construction (activities report, forum participation, input resources, collaborative writing). This way, the prejudices and reservations (often irrational) made by teachers about these new methods are to be overcome.

Taking into consideration the international recommendations on the matter, one of the school's main objectives is leading students to consciously and critically use ICT; therefore, theoretical and in-service teacher professional development courses are to be planned and implemented in the perspective of life-long learning. They will enable teachers to experiment directly online environments and promote personal researches on the ICT possible applications to the schooling process.

At the international level, special attention is paid to the promotion of the teachers' digital competence as ability in managing, exploring and assessing ICT, as well as adapting their content to teaching. In particular, teachers have to be endowed with basic digital literacy, ICT use, and ability in adapting ICT to teaching and in matching ICT with other teaching key-competencies.

In 2008 UNESCO issued the *ICT Competency Standards for Teachers*, providing guidelines aimed at improving the learning standards all over the world. This document states that ICT literacy is to be matched with a new pedagogic-didactic culture; therefore, teachers should be aware of this objective and be able to identify the components of education reform programs that correspond to these policy goals. Corresponding changes in the curriculum entailed by this approach might include improving basic literacy skills through technology and adding the development of ICT skills into relevant curriculum contexts.

The first aim of this project is to prepare learners, citizens, and a workforce that is capable of taking up new technologies so as to support social development and improve economic productivity. It can be fulfilled by adopting guidelines for all teachers, specifically for planning teacher education programs and training offerings that will prepare them to play an essential role in producing technology capable students. Today's classroom teachers need to be prepared to provide technology-supported learning opportunities for their students. Being prepared to use technology and knowing how that technology can support student learning have become integral skills in every teacher's professional repertoire.

In order to reach these goals, the UNESCO stated three Teacher Competence Standard Modules, as follows:

- technology literacy approach (developing the ICT knowledge by including basic digital literacy in the teacher training curriculum);

- knowledge deepening approach (improving the teachers' ability in using ICT to solve problems); and

- knowledge creation approach (increasing teachers' engagement in knowledge creation and innovation).

The ICT literacy is a part of a wider vision of the teacher training, including: policy and vision, curriculum and assessment, pedagogy, organisation and administration, and teacher professional development.

By crossing the three approaches to education reform, based on human capacity development (technology literacy, knowledge deepening, and knowledge creation), with the six components of the educational system (policy, curriculum, pedagogy, ICT, organization, and teacher training) a curriculum framework is created for the UNESCO ICT Competency Standards for Teachers (ICT-CST) project. Each of the cells of the matrix constitutes a module in this framework.

Special attention is paid to the methods to be adopted. In this perspective, student-centered teaching methods and collaborative projects in support of students' deep understand of key concepts and their application to solve complex and real problems are required. To support their collaborative projects, teachers would use network resources to help students collaborate, access information and communicate with external experts to analyze and solve their selected problems.

To this aim, teachers must also be able to use ICT, manage classroom data and support for their own professional development, even in a cooperative perspective; therefore, ICT-centered laboratories allowing the use of various technologies, tools, and e-content as part of whole class, group and individual student's activities should be realised. This way, anxiety, doubts and prejudices typical of neo-graduates not used to manage new technologies could be dispelled.

Educators adopting this approach will review the curriculum framework and the competency standards with an eye to develop new learning materials or revising current materials so as to support different abilities: digital skills, critical approach to knowledge and technological literacy, creative capacity of innovating teaching, student-centered teaching methods in an integrated perspective.

This kind of teacher professional development courses can be implemented both in the classroom and online, within suitable LCMS environments, where different approaches can be adopted and matched in order to make hypertext and multimedia content to be shared (Falcinelli-Laici, 2009).

E-learning is progressively adopting LSM and LCSM, to be integrated with the Web 2.0 tools (O'Reilly, 2005), that is open and polyvalent tools, allowing learning in a flexible, explorative, social and lucid way and establishing an active, constructive and interactive relationship between subjects and technologies.

These learning environments allow planning, using and managing tools suitable for an online-based learning as well as a cooperative approach to knowledge. They include different resources, suitable techniques, scaffolding strategies and tools suitable for a significant, creative and personal learning (Laici, 2007) by blending formal and informal approaches (Attwell et al., 2006; Downes, 2005). Informal e-learning includes indeed all the opportunities given by the networked learning and the online learning communities, based on the knowledge and information sharing and the cooperative knowledge construction (Mason, 2002).

## The Teacher Professional Development

A professional development course was planned in favour of the teachers involved in the above mentioned projects (Cl@ssi 2.0 and Leaning 4All). It concerns the use of technologies in teaching, paying special attention to the learning environment called Moodle (http://moodle.org) — an open-source web application for producing modular Internet-based courses to support a modern social constructionist pedagogy. A blended approach in teaching/learning doesn't mean to train teachers in using new technologies only, but to start a discovery of them together with students in order to find their potentialities and create a new teaching culture based on shared and integrated technologies that are at the teachers/students' disposal.

The courses in hand were structured on the basis of a blended (in the classroom and online teaching) model (Moodle: http://www.classionlineumbria.net) and were aimed at:

- promoting opportunities of communication, discussion and reflection for teachers, students, families and other concerned subjects;
- activating suitable environments to share documents and content, even multimedia, produced by teachers, experts (university tutors) and local education superintendency members;
- promoting a continuous interaction among teachers, experts (university tutors) and local education superintendency members in order to realise the necessary scaffolding;
- promoting opportunities of communication, discussion and reflection on the training course;
- promoting an experimentation of blended learning in the classroom (in the classroom and online teaching/learning) to be carried out by students both individually and in team;

- enabling students to integrate and expand content;
- enabling students to interact and share content;
- supporting the PoliCultura format (multimedia narration); and
- promoting the realization of learning and practice communities as innovative character of the teacher training.

The course began in 2010. Teachers involved in the project took part in three meetings (laboratories) held at the LIFU (Computer Science Laboratory of the University of Perugia) by Chiara Laici. Participants connected with a Moodle environment and worked within a specific category of training called "Area Test" that remained at their disposal as a testing area after the conclusion of the meetings, too. During the meetings, the following topics were treated: Moodle and its structure; the course design; roles (course creator, teacher, student); login; resources (username, folder, connection to a file or a website); activities (forum, chat, task, questions, glossary, database, choice, wiki); user's profile; schedule. The above-mentioned meeting aimed at enabling teachers to work personally and directly within the Moodle environment and its tools under the tutor's supervision. Therefore teachers had the opportunity of choosing from among resources and activities the most suitable ones to be experimented with their students in a blended learning perspective.

Three categories of course were activated within the environment: a Common Area, reserved for teachers; a School Area, reserved for the courses open to students; and the PoliCultura Area, supporting the realisation of the project in hand.

The second phase of the teacher training was carried out as online learning; therefore, a course named "Common communications" was set in the Common Area, where tools and content would be at the teachers' disposal during the following months. In this phase, the training course was open to the involved teachers as well as to those ones taking part in the "Class committees" (60 teachers in all).

The course was organised in different sections:

*Information and support:* reserved to continuous communication and interaction among tutors (Floriana Falcinelli and Chiara Laici – University of Perugia) and teachers. A forum news was activated in order to manage relevant information concerning meetings within schools, input of new documents, environment up-to-dating. A technical assistance forum was set in order to implement and manage the Moodle tools; it is still used by teachers (86 messages and 586 visits).

*Moodle content:* containing information about Moodle provided with PDF guides

and video-tutorials. This section enables teachers to autonomously re-use the tools tested in the experimental phase.

*Content:* containing the project information and some in-depth studies on the use or ICT in teaching.

*PoliCultura:* containing the content concerning the PoliCultura&Moodle experimental format, as a part of the FIRB Learning4All general project.

## Activities Carried Out by Teachers

Starting from October–November 2010, within the "School Area" section, the six teachers involved in this study have been putting into practice the content learnt in the first phase. Under the tutors' supervision, they started at least a course in each classroom, supported their students in their registration within the environment and started inputting autonomous content and tools destined to the teaching/learning activities.

In this phase, it was stated to open courses to all the subjects registered as "host," in order to allow the content and activities sharing. Also the students' parents were invited to register on the environment. In November 2010 some meetings destined to parents were organised in the schools whose students were involved in this project in order to show them the environment and its characteristics, as well as the activities that could be carried out both in the classroom and at home. Furthermore, some simulations by means of a LIM (whiteboard) were implemented. On the basis of the questions put by the students' parents a discussion on possibilities, problems and perspectives connected with blended learning in the classroom was carried out.

Today (the project in hand is in progress) the environment has 233 registered users, that is: 169 students, 60 teachers, 2 tutors and 2 member of the local education superintendency.

Teachers involved in the six courses input 182 resources, that is: 84 links to multimedia web resources (interactive websites), 75 texts, presentations of Excel files, 12 videos and 11 images. Furthermore, 20 tasks that are individual products realised by students were input; 4 chats and a disciplinary forums (in addition to the six default forums included in the courses format) and 2 question areas ("quiz") were organised.

Two of the selected schools decided to input materials produced by teachers as well as students' works in the online environment.

As far as the environment tools are concerned, teachers used the forum to communicate with their students, but the latter preferred by far to use the chat. In one of the schools involved in the project 2730 accesses were recorded in 39 sessions. An investigation carried out on the logs showed that students used the

chat even during the lesson time: a half of sessions were recorded within h. 13.30 and the remaining ones between h.15.00 and 19.00. Students informally used the chat: they kept in touch, input smiles, wrote in the local dialect, and sometimes used "bad words." During a meeting teachers proved worried about the language used by students and they declared that, after having read the chat, invited students to adopt a more proper language. Students obeyed their teachers, but continued using the chat in an informal way. It shows how students accepted the teachers' authority and allowed them taking part in their informal communication.

Considering that the project is still in progress, these data show that both students and teachers are efficiently using the environment resources. In particular, the presence of multimedia resources means that teachers are progressively assuming the role of facilitators in helping students select the opportunities offered by the net; therefore they are able to guide students in a filtered access to Internet and in a safe use of it.

## The PoliCultura Format within Moodle

In January 2011, an experimental area was reserved to PoliCultura&Moodle (see the FIRB Learning4All Project: www.policultura.it). It is a format realized by the Politecnico di Milano for the Italian schools and aims at promoting a multimedia (audio, imagines, texts) and multi-channel (web and mobile devices) narration on a given subject. PoliCultura&Moodle was planned by us by blending the PoliCultura format with Moodle. To this aim, university tutors planned a course to be held in each school availing itself of online environments and tools in order to realise a multimedia narration. This format includes: a forum helping choose the narration topic and the construction of the editorial format, a forum, a glossary and some wiki supporting the texts writing, some folders containing products (audios, texts, images), a forum hosting the discussion on the narration, and a folder containing the final results.

Four of the six foreseen courses are today active. Teachers have the opportunity of using all the online resources suggested by tutors or choosing some of them. Teachers and students decided to attend the courses set up by the university tutors and to adopt wiki tools instead the other tools (forum, glossaries, and folders). Fifteen, 6, 7 and 48 wikis suitable to write texts were respectively activated; both teachers and students used them for narration.

Aiming at deepening the carried out experience, teachers involved in this project were interviewed by the university tutors at the beginning of the project in order to gather their expectations; then, they periodically took note of the achieved progresses on a Moodle blog, as shown in the following example. Finally, in May 2011 they will be re-interviewed in order to individuate the possible benefits of the use of technology in the schooling process.

> Today we set to try to make recordings in class: this is a great challenge! It seems impossible that we can make a recording in a room full to the

> brim and the congenital inability to be silent, but the boys have decided and it begins. N. is the director with an imaginary "Action" in hand at all three must remain in complete silence. It's a beautiful thing: there seems to be almost a magic spell. You hear only the voice of the guy who reads and then a noisy and anachronistic silence. All are pricked and respect the rules established by the group of sound technicians (students) and N. (student). But that's not all: the other groups continue to work and are experiencing that, perhaps, it may also be in a group without shouting, calling, laughing, growling, trying all the time . . . poor teacher.

## Conclusions and Critical Questions

We can affirm that the above described blended learning process has had positive feedback and Moodle, planned as a strongly social environment, fulfilled the stated objectives. The teachers' participation in implementing courses and preparing resources and activities destined for students shows that they started to assume the role of protagonists in the teaching process. Furthermore, the continuous scaffolding carried out by tutors (through e-mail, telephone calls and forum) is enabling teachers to be in touch and discuss, even adopting different tools, methods and schedules. It has to be stressed that firstly teachers were afraid of sharing courses, narrations and products with their colleagues, but the coaching carried out by the university tutors helped them in starting working in a cooperative way.

The parents' participation and their involvement within the Moodle environment is not still effective because some have reservations about the use of computers by their children at home. Some teachers remarked that in Umbria there are still some problems concerning digital divide that could compromise the online access from home.

The characteristics of these courses show that teacher professional development needs for a long lapse of time to be realised as well as continuous scaffolding and monitoring activity.

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