

Classes 2.0: how to improve learning environment in the classroom through ICT¹

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Keywords: Teamwork, Educational Strategies, Teaching methods, Blended learning, Learning Environment

1. What does it mean “class 2.0”?

Cosa significa costruire una classe 2.0? Recentemente, in Italia è stato avviato un progetto denominato appunto Classi 2.0 che al momento si rivolge alle scuole medie ma dovrebbe espandersi successivamente anche alle scuole primarie e secondarie superiori. Fondamenti teorici e organizzazione di base. Non in laboratorio ma in classe. Consigli di classe numerosi

2. Digital natives and learning

In questo modo, gli apprendimenti digitali giovanili che nascono negli ambienti 2.0 si possono confrontare e sviluppare con quelli che si sviluppano in classe colmando la frattura fra apprendimento formale scolastico e informale. Il linguaggio dei digital natives può essere affrontato sul loro terreno e renderlo solido, orientato e coerente.

3. Goals of the project

In the previous paragraphs, we have analyzed the basic principles and social and communicative reasons which are the essential elements of the project Classes 2.0. Now, it is convenient to pause

¹ 1st and 2nd paragraphs have been written by Renza Cerri; 3rd and 4th paragraphs have been written by Davide Parmigiani; 5th paragraph has been written by Valentina Lupi and Elisabetta Ghezzi.

over both the objectives and aims of the project to show, trace and imagine the educational path. The principal goals are mainly three.

The first is called “Naturalization”. Some old technologies have become invisible (Bolter and Grusin 1999). The teachers don’t ask themselves anymore if they can use a book, the blackboard, their voice or an exercise book. Simply, they use them because the teachers think they are natural part of the learning environment. They feel that, without them, learning can’t develop and grow. This is the reason why the project “Classes 2.0” aims at “naturalizing” the digital technologies and web 2.0 especially. Naturalizing means to use them daily and in a continuative way in order to create a learning environment on the basis of their communicative, cognitive and social features .

The project provides that technologies 2.0 are be used in the classroom daily without going to a computer lab so they can become invisible progressively. The technological lessons are not an exception but they become a constant during educational activities. In addition, meaningful learning, cooperation and knowledge building can be emphasized with web 2.0 (see Scardamalia and Bereiter 2003; Garrison and Anderson 2003; Parmigiani 2009; Ligorio et al. 2009).

The second goal of the project is called “Sociality”. The teachers want to develop profound cooperative behaviour among the students. Through an effective use of technologies 2.0, the interaction among the students comes from the transmission of information and their close coordination to reach defined roles, share resources and common goals (Himmelman 1993; Misanchuk and Anderson 2001). Strijbos and Martens (2001) and Strijbos et al. (2004) have developed a model of group-based learning in which the activities of the group constantly change, from very closely guided cooperation with roles defined by the teacher, closed skills and well-structured tasks, (represented by the authors by the jigsaw technique), to a very open collaboration where there is a low level of pre-structuring of the group, and where the tasks are ill-structured and provide many solutions with terminal open skills (represented by the authors by the progressive inquiry technique). Usually, at school these two educational opportunities represent theoretical reference points. It is probable that a teacher can visualize various kinds of activities that would change depending on how they are held on three axes: high or low level pre-structuring of the group; well or ill-structured tasks; open or closed skills. In a class, for example, that has not yet had significant experience in cooperation, it is appropriate to consider a high level of pre-structuring of the group to avoid disrupting the team, as well as a clearly defined task to allow the teacher to monitor and handle the activities effectively. At the same time, a class with a lot of previous experience in cooperation, should be given less organized tasks, based on inquiry with minimal pre-structuring of the group because the students are already trained in assigning roles and tasks in an evenly balanced manner.

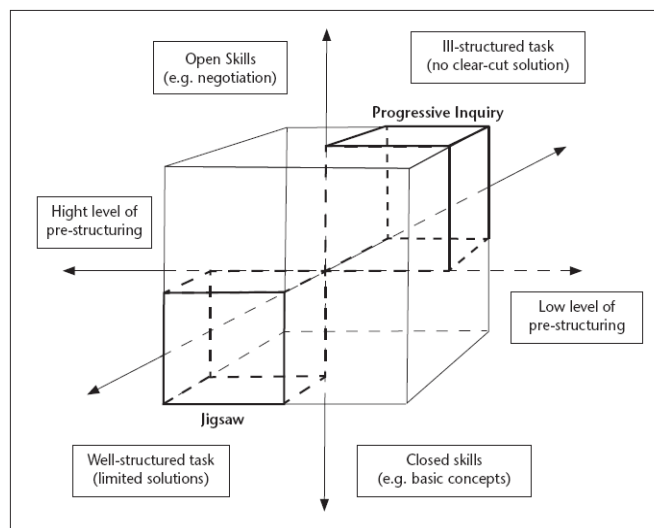


Fig. 1 Group-based learning Model (Strijbos and Martens, 2001)

Technologies 2.0 make these social processes easier which, in their turn, base cognitive ways and paths ever more meaningful because the students learn to participate in the building knowledge through the creation of learning communities in classroom and online. The students' participation is a basic feature because it allows starting metacognitive processes which support phases of self-evaluation and monitoring of their own learning (see Garrison, Anderson and Archer 2000; Cacciamani 2003). Web 2.0 and related technologies can optimize this development because it is founded on planning where the students are involved. As online, networks, blogs and self-produced websites highlight users' interactive skills to create information, material, data, so the pupils in classroom can build learning through educational activities online and offline (Garrison and Vaughan 2007; Ligorio, Cacciamani and Cesareni 2006) in a classroom structure that is similar to web 2.0 stressing the distinctive features.

The third objective of the project is directed towards "Mobility". Learning leaves the school and it spreads to other environments. In this way, time and space of learning increase and they link up with family, friends' group, etc. Individual learning varies and becomes a complex structure changing in team learning and completing the structured scholastic learning. The educational activities at school through e-learning platforms, blogs or websites encourage the students to broaden their learning styles linking scholastic formal learning with learning developed in informal contexts like home, social networks, friends' group, etc.

Finally, the project "Classes 2.0" allows teachers to direct and focus the educational activities on new communication ways and on kinds of learning that develop in these environments. Even if it's not an explicit aim, the project will start some research paths to define whether web 2.0 really helps and improves learning processes and how they support them: strong or critical points to orientate and generate further ways of building new learning environment.

4. Building the learning environment

The above mentioned objectives, clearly indicate the path to building a learning environment integrating old and new technologies where the pupils can play a leading role in the instructional planning. From an educational point of view, the teachers can choose two strategies.

The former is suitable for schools which do not have a wealth of scholastic experience with technologies so the teachers are afraid of not being able to change the learning environment effectively and of not orientating the pupils towards meaningful learning. In this case, it's convenient to start short educational activities (micro-testing) to avoid stress in teachers who participate in the project and to experiment the skills both of pupils and teachers in managing the new learning environment. The short activities will become ever more specified and coherent so that the class can develop and change in an advanced and technology-enhanced learning environment.

From a technical point of view, that means taking some of the following steps:

- the teachers have to identify some key competences to develop them (eg reading skills; critical thinking, learning from mistakes, metacognitive skills, etc.);
- each teacher plans and develops selected competences in respective subjects;
- each teacher questions what technologies 2.0 can be used to improve the development of selected competences;
- the team of teachers create a coherent class project with all the different activities involving pupils.

Teachers are used to work individually. During first months of the project, teachers try to collaborate with their colleagues to make similar their individual planning and building a common method for interacting with students and structuring the learning environment towards styles oriented to cooperation, inquiry and building knowledge. The role of web 2.0 is very meaningful because they help teachers and pupils to direct the class and the context towards an open learning environment where the students are able to find the most suitable ways for their learning.

The second strategy is more suitable for schools which have already experimented educational activities with technologies and they are able to write and develop a wide ranging project. For these schools, the main objective is the creation of a path that involves all colleagues immediately in using web 2.0 during daily educational activities. In addition, the team teaching can start advanced research processes to identify new types and styles in organizing and building knowledge (Overdijk and Van Diggelen 2009).

Anyway, teachers of both schools will be able to develop new methods and teaching styles for design and assessment where technologies 2.0 are the central thread. The planning has to be a corporate decision, that is the team of the teachers will be able to cooperate to build an environment where each of them can apply their own educational and technological skills for a class where the pupils can interact and develop knowledge and skills. For this reason, a part of the emotional and cognitive resources have to be used for the construction of a cohesive team of teachers to make the learning environment, at the same time, lasting (to face meaningful and hard learning) and challenging (to build, create and look for new types of knowledge). This feature needs an especial effort for Italian lower secondary schools because there is not the team teaching tradition. Teachers are used to work individually and they have not opportunity to plan together. Instead, for a project like “Classes 2.0”, it’s necessary for the teachers to have a remarkable and considerable amount of time to design and rethink about the learning environment to change it into an interactive context where also the furniture (desks, bookcases, etc.) promote and help the pupils to face the knowledge and to change, elaborate, internalize it. In the following paragraph, we show an ongoing project written and carried out by an Italian lower secondary school.

5. An example of project.

The Lower Secondary School “Don Milani” in Genoa has intended to join the National Project [Cl@ssi 2.0](#) (2.0 Classrooms) as an experimental school (Progetto Scuola-Laboratorio, ex D.M.P.I. 6/3/2006) whose action-research aims to deploy technologies both in teachers’ professional development and to improve teaching practice. Its teachers’ board has been selected to carry out this project because it includes a high number of teachers with good IT competence and high motivation to apply it to enhance students’ learning.

Here below is the project which has been developed from the current school year 2009-2010 and is going to be gradually adjusted over the 3 years of the project’s schedule.

Our main goal is to improve learning by supporting the social construction of competences that play a key role in becoming mature citizens. Web 2.0 offers new opportunities to interact, cooperate and build together products and meanings. This gives rise to the possibility of foster complex processes of cooperative learning, in line with the school mission (“citizenship key competences” in listed in the National prescriptions as well as in those of the European Union). For this reason, we aim to completely integrate the use of 2.0 Technology in everyday teaching. This will lead us to update our working tools and to move closer to the world of digital natives.

We thus decided to undertake the following points:

- integrating ICT 2.0 in subject and interdisciplinary teaching;
- using ICT 2.0 in the process of evaluating and self-evaluating (by means of shared electronic class registers, exchange and analysis of teaching materials on the school platform, use of discussion forums, use of blogs as logbooks and as a negotiation space for the classroom)
- using ICT 2.0 for class management (e-messaging, sharing files and materials with families as well);
- using ICT 2.0 to create individual learning paths, in order to help students with special needs and provide additional support to individual work, both at school and at home;
- qualifying learning as concerns the acquisition of both content and competence;
- value digital natives’ competences, as well as attitudes, expression ability and creativity of all students as individuals and as a group.

- using ICT 2.0 to stimulate teachers' working skills and creativity.

As concerns the first year of this experimentation, we are carrying out the following activities:

- analysing the setting: positive/critical areas of people involved in the project (teachers, students, parents), through study and tailor-made questionnaires;
- presenting an outline of the project to parents and sharing the basic ideas of the planned learning path with the students
- purchasing an initial set of equipment (netbooks for students' use, a IWB - Interactive White Blackboard, a printer, a videocamera, digital cameras, personal lockers);
- first action of ICT integration in everyday's learning practice, based on the school situation: common curriculum, expected skills, cross-subject activities, , shared tests, etc....
- Digital recording of the activities (with students' collaboration) and of the first common teaching units;
- Using "Google" and *open source* tools for communicating and sharing (blogs, websites, mailing list);
- Familiarization with the available ICT tools (PC and video in the classroom, LIM, Internet, netbook for the students);
- Considering the classroom as a "physical space for learning", thanks to the support of web 2.0 tools, in order to create a new environment with the new tools;
- Creating a structure and some initial materials for student' e-portfolios;

In the following years, we will focus on the following points:

- Creating a new classroom environment with new furniture more suitable to class activities;
- Constant use of netbooks in everyday practice;
- Creation of original artistic products (as multimedia materials) apt to bring about a positive added value for the whole school
- Set up of a platform to be used by students;
- Creation of specific products related to laboratory areas (by recording, elaborating and analyzing the activities carried out, developing metacognitive skills based on activity recording, sharing and discussing the recorded experiences);

We have then detected specific main directions of this experimentation in our school, in order to achieve these goals also through the newest technologies. Chart 1 details these aspects:

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|--|---|
| School project "Scuola Laboratorio Don Milani, D.M. 10 marzo 2006" | Experimentation CI@ssi2.0 |
| Teaching area (teaching-pedagogical aspects-features) | |
| Optimizing teaching paths to enhance citizenship key competence | Emphasizing the teaching areas in the <i>Shared curriculum</i> in line with our Experimental School using digital languages |
| Organizational area (Organizational plan - handling times and spaces) | |
| Identifying and finalizing organizational patterns focused on individualization of curricula and on developing skills. | Using the classroom as a lab, arranging it as a flexible setting, considering the use of technology for specific activities. The tools used will allow a dilation of learning time beyond the school schedule |
| Research area (professional growth) | |
| Developing action-research. dissemination of results by means of reports, lectures, meetings | Carrying out action-research focusing on TIC used in teaching |
| Evaluation area | |

| | |
|---|---|
| Self evaluation, monitoring, evaluation | <p>Self evaluation and supervising: quality of the project (analyzing the value of experience, analyzing the potential expressed by the experience, identifying the value perceived by the users, the families, the context, comparisons with teachers of different Classrooms 2.0, comparison with a control classroom)</p> <p>Evaluating the learning (involvement, subject and cross-subject learning, citizenship key competence). Evaluating the educational paths using technology in teaching.</p> |
|---|---|

We have then planned a disciplinary development plan and laboratory: each teacher will also handle their subjects using activities more focused on technology.

| Subject areas | Experimentation Cl@ssi2.0 |
|---------------------------------------|--|
| Languages: Italian – English - French | <ul style="list-style-type: none"> ▪ Use of real material on-line ▪ Exchange through video conference, among other means <ul style="list-style-type: none"> ▪ Collaborative writing using a PC ▪ blogging ▪ writing personal stories with multimedia tools ▪ multimedia activities: identifying words, writing (formazione) words, crosswords, word games, word forming and matching with pictures; <ul style="list-style-type: none"> ▪ reading-writing activities in a multimedia environment: <ol style="list-style-type: none"> a. <i>cloze</i> with animations, use of e-dictionaries, (monolingual, bilingual or dedicated) b. writing emails and reading other students' emails; c. exploring different areas using particularly interesting International web sites; <ul style="list-style-type: none"> ▪ using CLIL in foreign languages using material online or software in the LIM (made by foreign teachers) ▪ using specific online software for expression or decision making |
| History and geography | <ul style="list-style-type: none"> ▪ using Google Earth and Google Maps to study environments and areas ▪ using software and sharing specific materials to introduce and to deepen concepts and knowledge (theme maps, maps and historical maps) <ul style="list-style-type: none"> ▪ seeking and using online materials and files; ▪ using specific software/groupware: <ol style="list-style-type: none"> a. to share and discuss problems; b. to build up conceptual maps c. to build metacognitive paths d. to produce materials and essays • using CLIL (Content and Language Integrated Learning) in foreign languages by means of online material or software in the LIM (made by foreign teachers) • using specific online software for expression or decision making • Use of software to make conceptual maps |

| | |
|--------------------------------|--|
| <p>Mathematics, Technology</p> | <ul style="list-style-type: none"> ▪ Make paper and digital essays with the help of the competence of Maths and Technology teachers together in the classroom, mainly in Geometry; ▪ Use of Excel to: <ul style="list-style-type: none"> - insert and process data; - build up and analyse graphics; - use of the mail features of the software; ▪ Approaching the study of Maths using Alnuset, a dynamic interactive multi-environment system. <ul style="list-style-type: none"> ▪ Choosing and analysing an interdisciplinary path connected to students' everyday life; collecting materials (analysing and producing maps, photos, texts) also using online software (Google-Map, Map-Live); final elaboration of a digital product (KompoZer, Picasa3). ▪ Additional records to textbook for reference study (videoclips, documentaries, charts) ▪ using specific online software for expression or decision making ▪ Use of software to create conceptual maps |
| <p>Physical Education</p> | <ul style="list-style-type: none"> ▪ Using videos to analyze motion and non verbal language ▪ Making game plans in different sports ▪ Using software to plan sports games |
| <p>Art</p> | <ul style="list-style-type: none"> ▪ Digital photography <ol style="list-style-type: none"> a. technique b. learning and using basic features of specific software (Photoshop elements / Picasa) ▪ Reading a work of art by interpreting graphical data (by means of specific software) ▪ Computer in Art: <i>Web art</i> ▪ Learning to use Power point to plan/record/test an educational path (e.g. teaching units of patrimony education / expressive lab) <ul style="list-style-type: none"> ▪ Planning and creating an animation movie (using specific software) |
| <p>Musica</p> | <ul style="list-style-type: none"> ▪ on-line and multimedia activities: sound games, reading and reproducing voice and instruments ▪ use of software to write music ▪ Seeking and using online material and files ▪ Using groupware ▪ Using specific software to: <ol style="list-style-type: none"> a. record b. edit, process sound c. convert audio and video material; |
| <p>Special needs</p> | <ul style="list-style-type: none"> ▪ Use of learning technology to empower all the communicative canals (working on colours, sounds, shapes) in order to improve manual use of mouse and keyboard <ul style="list-style-type: none"> ▪ Use of audio/video recording to "watch oneself again" in order to improve self-esteem, to record activities and involvement, to strengthen personal identity and the feeling of belonging to a group |

Most activities will be recorded during their development, and will include a final product based on *tasks* (Ellis 2006). Such products will be collected into a personal and classroom e-portfolio.

This is just the start of a nice adventure, which is also a chance to improve Italian school. The result of the experimentation will address us to a new shared practice thanks to which the school will be closer to the students.

The expression "I care", typical of Don Milani, after whom our school is named, is the idea which inspires us. We like to think that this opportunity will allow us to strengthen the ultimate meaning of studying, understood as a high civil responsibility, in the hope that this can help to establish and make concrete the value of a fear-free, richer and more thoughtful school, in which the passion for acquiring and sharing knowledge could ever become stronger

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