

Competency-based Education with Web 2.0

Pierfranco Ravotto
AICA
p.ravotto@aicanet.it

Introduction

The European Commission, training experts and national/local authorities have been insisting for long on two educational themes: competency- based education and the use of ICT to support education and training.

These two themes have generally been treated in a distinct way. And if we join them: can we promote a competence-based learning through the use of ICT?

In this paper I will try to provide an affirmative answer to such a question, also on the basis of the experience done in Sloop2desc, a project funded under the EU Lifelong Learning Programme. Firstly I will treat the two issues separately, and then I will give evidence that joining them together is not a mere a sum, but a synergistic effect.

Competence-based education

School and universities are invited, from many subjects, to shift the emphasis away from the "content" of teaching and from training paths to the "learning outcomes" achieved, which can be used in the study, in the world of work and in any other social context, from single subjects to competences, are they key competences or professional ones.

But what do we mean by competences? Everyone is familiar with the European Qualification Framework, EQF, [1], while the European e-Competences Framework, e-CF [2] which applies the EQF model to ICT competences is less known for now. These two documents substantially provide the same definition of competence.

From EQF we read:

*“Competence means the proven ability to use **knowledge, skills and personal, social and/or methodological abilities**, in work or study situations and in professional and personal development”.*

From this we can derive that the components of the competence are as follows:

- Knowledge defined as *“the outcome of the assimilation of information through learning. Knowledge is constituted by a set of facts, principles, theories and practices related to a field of work or study”.*
- Skill defined as *“the ability to apply knowledge and use know-how to complete tasks and solve problems”.*
- Personal, social and/or methodological abilities.

But competence is not a simple summation of them: it is the proven ability to use them in a context!

From e-CF we read:

*“Competence is a demonstrated ability to apply **knowledge, skills and attitudes** to achieving observable results”.*

Also in this case the single components are listed and described:

- *“**Knowledge** represents the “set of know-what” (e.g. programming languages, design tools...) and can be described by operational descriptions.*
- ***Skill** is defined as the ability to carry out managerial or technical tasks.*
- ***Attitude** means ... the ‘cognitive and relational capacity’ (e.g. analysis capacity, synthesis capacity, flexibility, pragmatism,...).*

(In e-CF the term “attitude” replaces “personal, social and/or methodological abilities”. The Users’ guide specifies: *“It is close to the concepts of “manner” and “demeanour”, it is the French “savoir être”.*)”.

e-CF also contains the following concepts: *“If skills and knowledge are the components, attitudes are the **glue**, which keeps them together”.*

What information can we draw for school and university? Essentially the following two main concepts:

- all three components - knowledge, skills and attitudes (I use this more synthetic term, but I consider it, at least in the first approximation, equivalent to "personal, social and/or methodological abilities") - must be taken into account;
- it's not enough to ensure the acquisition of knowledge and skills, or the possession of attitudes; it's necessary to promote their application in situations to get observable results.

As far as **knowledge** is concerned, schools and universities have already done a huge amount of work.

With regard to the concept of **skills** the situation is varied. Technical schools have always promoted them; other schools and also universities have often considered them as a spin-off effect, almost automatic, of knowledge or as something to be left to the work context.

Knowledge and skills are indeed intertwined, but if skills can generally originate from knowledge, it is also true that "doing" can stimulate the acquisition of knowledge.

In addition, the acquisition of skills is more likely to be self-checked by the student with a positive effect on her/his involvement in the achievement of learning goals and on her/his motivation to learn.

The matter of **attitudes** is more complex. The risk is to consider them a personal characteristic, something determined by genes and/or social conditions, something on which the primary school may take action, while university and perhaps even the secondary school can't intervene any longer being them already acquired (or not acquired) at that time. So the "glue", that holds together knowledge and skills and which is an essential component of competence, is often left out of the training, or, anyway, there is not a conscious, explicit and "organized" intervention.

Finally how to put students into *context* already during the training? How to encourage them to produce **observable results**? Non-formal experiences, generally of two types, already exist, they are work placements and project work. By definition the former type occurs in the context of work with its dynamics and its products, while the projects focus on results to be achieved, individually or in groups, and generally goes beyond the mere disciplinary scope.

What suggestions can be given to promote a competence-based teaching? In my opinion the following ones may help:

- clearly define the competences to be achieved as a basis of the educational contract with students,
- precisely define the knowledge and skills on which those competences are based and provide "objective" evaluation tests,
- make the necessary attitudes explicit and help students self-evaluate and improve in respect to them,
- propose collaborative project activities suitable to make students consolidate and reinforce knowledge and skills, and in which they could measure and develop their attitudes (personal, social, methodological abilities),
- organize experiences to be carried out outside school/university where, again, they could measure and enhance knowledge, skills and attitudes.

ICT (and the web 2.0) as a learning environment

A mature technology changes people's habits and it becomes part of the "natural" environment in which they live. The idea of "travelling" was certainly different before the train, the car and the plane. For us today, unlike most of the generations of homo sapiens who have "travelled" before us, it goes without saying that travelling implies the choice among such means; nowadays a long journey on foot may represent a news, hence the reputation of the Camino de Compostela.

The idea of "writing", depending on the era, has recalled the wax tablet on which to engrave with a stylus, the papyrus, a quill pen and ink, paper and pen, the keyboard of a computer, and now for someone still a table, the iPad screen. Technology is considered as such when it innovates, after that it becomes part of the environment.

ICT and mobile devices are, by now, the natural environment to communicate, to search for and transmit information, to plan, store and share documents, photos and videos. They are the environment in which we work, the one in which young people grow up, play and communicate to each other. The school can't remain apart, must learn how to teach "in the" digital technology.

I say "teaching in the technology" not as opposed to teaching "the" technology or teaching "with technology", but to show it as part of the environment in which teaching and learning intertwine: an environment that is made of natural classrooms and "virtual" ones, of slate whiteboard and interactive whiteboard, and LIM, desks, chairs and e-learning platforms, books and eBooks, pens and notebooks, podcasts, videos, forums, chat, audio and video conferencing, mobile phones, smart phones, net books.

It's an environment where students and teachers can access a wide variety of tools

- to develop resources: word processing, spreadsheet, presentation and programs to draw, for digital recording, photographing, filming, to build simulations ,
- to produce resources collaboratively: GoogleDoc, wiki, MindMap, ...,
- to share resources: YouTube, Slideshare, ...,
- to communicate to one another synchronously and asynchronously: Skype, messenger, forum, e-mail, SMS, blogs, ...,
- to search for information: Google or other search engines and the entire Internet.

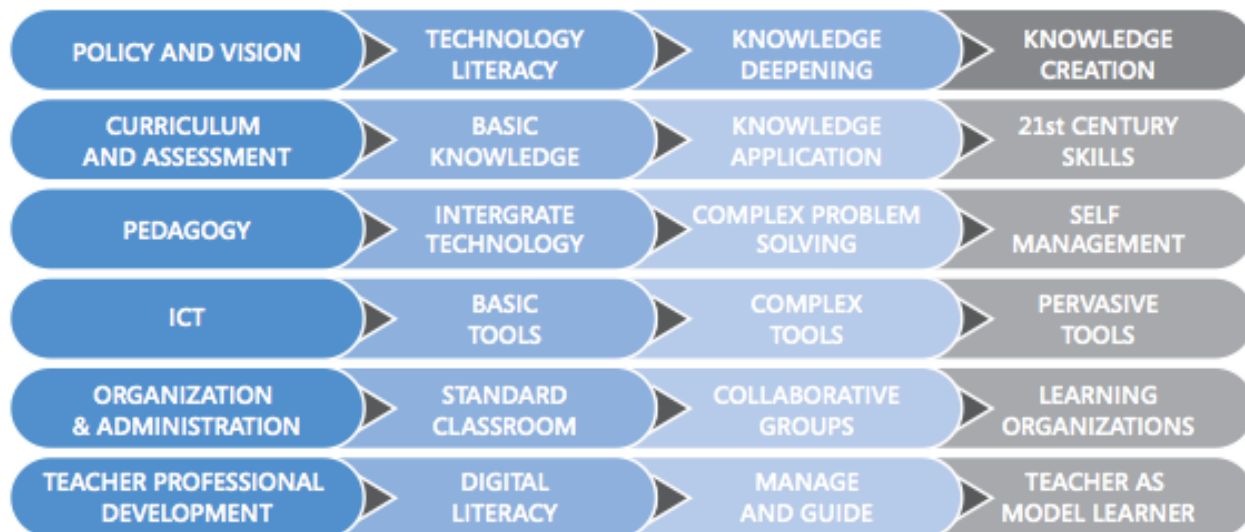
In such an environment the student will probably learn in the same complex and varied way, as women and men have ever learned: by trial and error, by imitation, by hints, memorizing, thinking and questioning, by intuition, discussion, ... gradually including new elements in their cognitive matrix and, more occasionally, restructuring it.

Rather the teachers have to play their role in a different way different from the past: the environment of the nineteenth

and twentieth-century class was limited geographically (the classroom), temporally (the period of the lesson, usually marked by the bell) and as for the instruments (chalk and blackboard, a map, pen, notebook, square and compass) and content (the textbook).

The learning environment is now unlimited. Mobile devices and the Internet allow you to be in touch anywhere, anytime. The available tools are, as stated above, many and varied. All the resources on the Internet are accessible to anyone and in 2008 - according to a calculation made by researchers at the University of San Diego (California) – were about 9,570,000,000,000,000,000,000,000 byte, almost 10 yottabyte (10,000 billion terabytes, where a terabyte equals 1,000 gigabytes and can contain more than 3,000 copies of the Encyclopaedia Britannica)! An huge heap of both high quality and real junk, full of potential, but also a possible cause of confusion.

In a conference under the auspices of UNESCO, like this one, I cannot but recall in this regard, as UNESCO *has set* - in the *UNESCO ICT Competency Standards for Teachers* - the competences required for teachers to act in such an environment.



Before closing this point, I would like to highlight a feature of the new environment for communication, work and learning, the one known as Web 2.0 and which has been revived by the open source and open content movement.

There is a philosophy - and practice -, which underlies many of these tools: the participation of users in the production of content, collaboration, knowledge sharing, collective intelligence, and community building.

Such a philosophy and related activities are already wide spreading in the community of teachers, but they can and must impact also on a different relationship between students and learning content: students not only as beneficiaries but also as producers of content.

The Sloop2desc project and its achievement

Sloop2desc is a TOI, Transfer of Innovation, project, funded by LLP Leonardo da Vinci programme, 2009. The Promoter is the ITD-CNR in Palermo. The partnership includes Italian partners, AICA is one, Irish, Romanians and Slovenians. The previous project SLOOP, *Sharing Learning Objects in an Open Perspective*, specifically aimed at the development of a community of teachers interested in integrating online and face-to-face education and producing and sharing open educational resources; namely to freely use, modify and distribute them. Addressed, therefore, the question of the use of ICT as a learning environment.

By developing an online course for teachers - how to use the Internet in teaching and how to produce open digital resources for online teaching - the project has researched how to develop teachers' competences, especially the ones that are described by the UNESCO document. It focused on how to develop such competences through e-learning. The SLOOP course has not only been designed for the acquisition of knowledge - as many other online courses -, but also of skills, attitudes and competences.

This is the innovative model taken up and developed by Sloop2desc (where "2desc" stands for *TO develop European skills and competences*), which has made the issue of competence-based learning explicit in its courses.

The following table shows the breakdown of the course.

Modules		Length	Units	Learning outcomes
1	Using MOODLE as a trainee and as a teacher	3 weeks	Using Moodle as trainee	<ol style="list-style-type: none"> use Moodle as a trainee: <ul style="list-style-type: none"> how to register oneself, fill in one's own profile, insert one's own photo how to exchange messages with other registered trainees; how to enrol on a course and monitor one's own activities; how to take part in a forum;
			Using Moodle as trainer	<ol style="list-style-type: none"> perform tutoring activities (as a teacher not as an editor): <ul style="list-style-type: none"> how to monitor trainees' or groups of trainees' activities; create or modify a course (as a teacher/editor): <ul style="list-style-type: none"> how to add resources to a course: label, link, text page, web page, folder; how to insert activities in a course: forum, online task, lesson, quiz, hot potatoes quiz, SCORMs, wiki, register; how to insert an embed code in a label or in a web page to reproduce resources existing in other sites such as Slide Share, YouTube, Scribd, ...; create a course: <ul style="list-style-type: none"> how to open ex-novo a new course or starting from a pre-existing course; how to assign and modify roles.
2	Being an online tutor and using web 2.0 tools	3 weeks	The online tutor	<ol style="list-style-type: none"> To indicate the main characteristics of the role of the online tutor
			To create, organize and share resources on the Net	<ol style="list-style-type: none"> To search and organize knowledge sources through the web 2.0 tools: <ul style="list-style-type: none"> list of references on the Web, social bookmarking (Delicious, ...);
			E-cooperation	<ol style="list-style-type: none"> to cooperate online in synchronous and asynchronous way, through Web tools such as: <ul style="list-style-type: none"> Skype, Forum; To use tools for collaborative knowledge production, such as: <ul style="list-style-type: none"> Googledoc wiki; to promote role playing and simulations.
3	Using and developing open educational resources for an eLearning environment	3 weeks	Sharing and reusability philosophy	<ol style="list-style-type: none"> provide definitions of "open educational resources" or "open learning objects"; describe the several Creative Commons licences;
			Web 2.0 tools for sharing	<ol style="list-style-type: none"> share resources in web 2.0 environments (such as Slide Share, YouTube, Scribd, ...) tagging them to make search easier;
			The SCORM model and tools for the production of SCORM compliant LOs	<ol style="list-style-type: none"> describe the SCORM model; describe the IEEE LOM metadata system; develop a SCORM by using software like eXeLearning

			Sloop repository	7. search for educational resources within a repository
4	European Qualification Framework (EQF), e-Competence Framework (e-CF) and EUCIP standard	2 weeks	EQF	1. describe the aim of 'European Qualification Framework for Lifelong Learning - EQF – and its level-based structure;
			e-CF	2. describe the structure of European e-Competence Framework, e-CF;
			EUCIP	3. describe the EUCIP model of informatics competences and professional profiles; 4. list EUCIP certifications and related certification procedures; 5. identify, within the EUCIP Syllabus, the competence core units required for a specific professional profile; 6. use the Eucip self-assessment tool to outline one's own proximity profile; 7. analyse one's own or other's out coming profile in order to identify what training needs are needed to achieve a specific professional profile.
5	Collaborative development of educational resources based on EUCIP standard	6 weeks	Development of OERs on the Eucip syllabus	1. plan open educational resources; 2. develop open educational resources using a wide range of tools; 3. make the educational resources open providing them with a suitable licence, source accessibility, instructions how to use or modify them. 4. cooperate in planning and developing a course on Moodle.

It is worth clarifying that the online learning model we adopted is the virtual classroom in the Moodle environment:

- the participants are organized into classes (30-40 people with two tutors), each of them in their own "course",
- activities are scheduled so that the students carry out activities at the same time,
- a strong interaction is required between the students and between students and tutors (in forums and using e-mails, chat, videoconferences) sometimes as debates and exchanges of ideas, some other times as cooperation in carrying out activities (also using tools such as wikis, googledoc, mindmap, ...).

The course expects the acquisition of a set of **knowledge**, for example, concerning the CreativeCommons licenses, the European documents on key competences, EQF, e-CF, the EUCIP syllabus, ... To provide such knowledge either links to existing presentations and to the original documents have been included or slides with audio, or videos or SCORM objects have been developed.

To consolidate this knowledge, activities like "reading, listening,..." have been accompanied by a request to discuss it in forums starting from inputs provided by the tutors. For example: "What CreativeCommons license do you think is more suitable for teaching materials?"

The Sloop2desc course intends to promote several **skills**, for example how to use Moodle and tools for the production of learning resources - Exelearning, SlideShare, ... – and for communication and collaboration - Skype, Wiki, GoogleDoc, ... - or for sharing (yet SlideShare, freeLOms).

To promote the acquisition of these skills the course proposes

- existing, or ad hoc developed tutorials, often in the form of videos on YouTube (or Vimeo) or SlideShare presentations,
- work proposals, sometimes individual, sometimes in groups. So, for example, as for the use of Moodle a "trial course" has been created where participants could practice including resources and activities.

All the modules have a discussion forum and, therefore, the discussions among peers and between peers and tutors - is one of the main features of the course. In Modules 2 and 3 collaborative activities are planned. Collaborative activity in Module 2 is essentially functional to learn how to use tools like Skype, GoogleDoc and the wiki. In Module 5 collaborative work aims at the production of resources to be used with students.

Discussions and collaborative activities help develop a set of attitudes related to exchanges of ideas, acceptance of

different points of view, assumption of responsibility and, where appropriate, leadership.

Finally the course has aimed at the production, by participants, of learning resources for their students, resources to be used in an eLearning and competence-based learning context. So the participants have been provided with a context where they had to work together to produce observable results, applying and developing knowledge, skills and attitudes.

Conclusion

The Sloop2desc project is about to finish but the evaluation activities have not been completed yet. The project results will be presented in September 2011 in a booklet and in final seminars in the partners' countries.

Anyway, we can already anticipate that most of the participants have greatly appreciated the course; in many cases the participants have already started to transfer what they have learned and experienced to their classes.

And from this we will be able to get a sound feedback on the Sloop2desc model.

Integrating online with face-to-face learning and using digital technology as a learning environment is not only a way to speak the same language of our students, digital natives, but also a way to make teaching and learning more flexible and personalized, to make students "acting" rather than "acted upon", involving them in activities that produce observable results.