



# The WEL initiative: a model of web enhanced learning for faculty members

Francesca Puddu, Manuela Repetto, Elisabetta Vallarino

Istituto Tecnologie Didattiche - CNR

[puddu, repetto, vallarino]@itd.cnr.it

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## Abstract

The pedagogy of subject-oriented faculty members is usually marked by spontaneousness acquired first as a student and later on as a teacher. Teachers hardly ever have the opportunity to approach instructional design methodologies. While in the case of traditional classroom activities this limit can be ignored, it cannot when a teacher chooses to adopt Technology Enhanced Learning (TEL) strategies. The WEL initiative, carried out within the project Unirete, is aimed both at experimenting the adoption by faculty members of an Instructional Design model, and at detecting correlations among the type of subject matter and the selected TEL approach. This paper describes the model applied within WEL initiative and early considerations on its results and further developments.

## 1 Introduction

In recent years attention on university teacher training on the use of tools and methodologies for Instructional Design (ID) has progressively increased (Bongalos et al., 2006). Within a successful project and besides technology, researchers in the field tend to highlight such features as its permanent structure or reference service or the existence of a methodological support.

The WEL initiative of UniRete project is aimed at attaining two specific objectives:

- devising and experimenting a model for the acquisition of knowledge and the development of competencies of instructional design with subject-oriented university teachers;
- investigating correlations between subject matter and types of TEL activities, that is, to what extent disciplinary aspects affect design choices as to the adoption of TEL approaches.

This activity takes place within UniRete project of the University of Genoa in collaboration with the “AulaWeb” service of the same university. Consistently with the above objectives the project provides two key phases:

- definition of a project-based formative model on instructional design methodologies (ID) for TEL and its testing on a sample of fifty teachers out of seven-hundred that participate in AulaWeb;
- analysis of teachers’ attitudes on TEL strategies selection within their teaching area.

Such analysis is carried out via periodical conversations, based on the mentioned formative model, between each teacher involved in the WEL experimental phase and their co-designer (an ITD researcher), who supports them in the first experience of TEL design. Coaching is considered necessary to sensitize teachers on uses of TEL they wouldn’t initiate due to the lack of experience and knowledge in TEL design practices.

In fact, while in higher education the teacher is per se subject-oriented and rarely comes into contact with instructional design methodologies, in TEL planning the most effective instructional strategy for each formative objective to be attained with the support of technology, is essential (Trentin, 2006).

This research aims at understanding to what extent the adopted approach is affected by the choice of the best strategy to attain a given formative goal, or by a technology not suitable for processing/managing specific disciplinary contents and/or specific educational strategies. And, in the latter case, positive actions to enhance the effectiveness of current TEL technologies could be suggested.

## 2 The methodology

As mentioned in the introduction, along its development phases, WEL initiative has followed the rules of Project-Based Learning (Kilpatrick, 1918; Howard, 2002) aimed at promoting mastery in Instructional Design methodologies among teachers, for a real educational innovation enhanced by ICT.

Since the beginning the strategy of the formative itinerary has assumed an intentionally operative approach focused on the realisation of an educational project (an academic online course) that encouraged teachers to activate methodological and design competencies to be improved through new knowledge building.

The WEL project phases are structured in a series of periodical collective and individual conversations led by a team of ID experts on design methodologies and development of online itineraries, which have supplied the foundation and the necessary tools for refining and developing the designing ideas accrued during the experimentation.

The key passages of the methodological approach and the related objectives are the following:

- *Plenaries of course start up* aimed at providing principles of Instructional Design applied to online learning, an overview on how ICT can be used to enhance learning in higher education, the requirements to orient teachers towards strategic choices peculiar to the subsequent operative phases.
- *One-to-one design conversation* functional for the selected course planning to experiment the new methodological approaches envisaged by WEL initiative. The individual meetings should supply the following results:
  1. completion and final compilation of the “project description form” assigned as support to a methodologically correct structure for the formative project under development;
  2. modularization of the course;
  3. drawing of the first sections of the course guide;
  4. definition of the course schedule.
- *One-to-one educational micro-design conversation* necessary to plan the development of online activities (lessons, case studies, problem solving, questionnaires, ...) included in the educational project - defining formative objectives and reference contents, structuring the modalities of activity management, establishing the necessary resources, organizing the communication logical structure, ...
- *Final one-to-one conversation* to monitor project progress in view of

its implementation and delivery.

In parallel to the design and methodological conversations, it was considered necessary to study in-depth technologies used in the development of the online portions of the various formative projects.

To this aim two events were organized:

- *Techno-methodological Workshops* to create a contact point between methodological aspects design and the supporting technologies. Specifically, these meetings featured two phases:
  1. presentation of the main functions of Moodle platform to be used by teachers for course delivery;
  2. overview of some technological products to simplify tasks implementation and development of online material devised by teachers such as e-content, video lectures, collaborative writing, case studies and moderated enquiries.
- *Thematic seminars* focused on technologies selected by teachers for the development of online activities envisaged in their own educational project.

Transversally to the mentioned face to face meetings, an online space for the whole communication flow supporting the *Technology Enhanced Learning*, was made available for each course on the platform of AulaWeb project for online education.

Moreover, during its implementation a Moodle environment for training named *Gymnasium* was made accessible to encourage teachers to experiment issues related to the transfer to an e-learning infrastructure of educational components developed during the design phases, specifically:

- how to subdivide Modules to create an online environment mirroring the modularization of the course according to the teaching programme;
- how to manage and organize resources and learning materials (files, contents, databases, ...);
- how to present online activities and promote them at a distance;
- how to use synchronous and asynchronous communication tools;
- how to carry out online assessment using the platform detection tools;
- how to administer the potential students (profile administration, organization of virtual groups, ...).

From what stated so far, the aim of WEL initiative was not the training of e-learning designers. Subject-oriented teachers used to organize the content of each lesson to deliver in the classroom, experimented the importance of programming their own teaching project through the use of a well established and effective design model. Such model was supposed to promote an innovative method to attain the expected educational objectives.

### 3 The detection tools

The detection tools used in WEL are the following:

1. profiling questionnaires
2. project report
3. interest poll towards seminars on ICT tools

It should be noted that the University of Genoa sent a call for participation to all university members without specifying prerequisites for participation. That is why a well designed poll was essential to describe the profile of teachers involved.

The profiling questionnaire consisted of three sub-sessions:

1. acquisition of personal data on each teacher and their course - subject, number of students, typology of course (PhD Master, University course)
2. recognition of each teacher's knowledge on ICT and its use in education
3. acquisition of information about the preferential approach for the course TEL design (blended, online...) as well as for the development of educational activities (content based or collaborative...)

Before the first face to face meeting we received 52 teacher's profiling polls (45 courses). We have noticed that only 13% of teachers considers their level of ICT competences low, 64% thinks that their level of knowledge in the same field is medium, 22% considers that their level is high. Data regarding the experience in the use of ICT are even more surprising - 82% of teachers had already used ICT for collaborative e-tivities. Fig.1 represents the distribution of teachers at the various faculties.

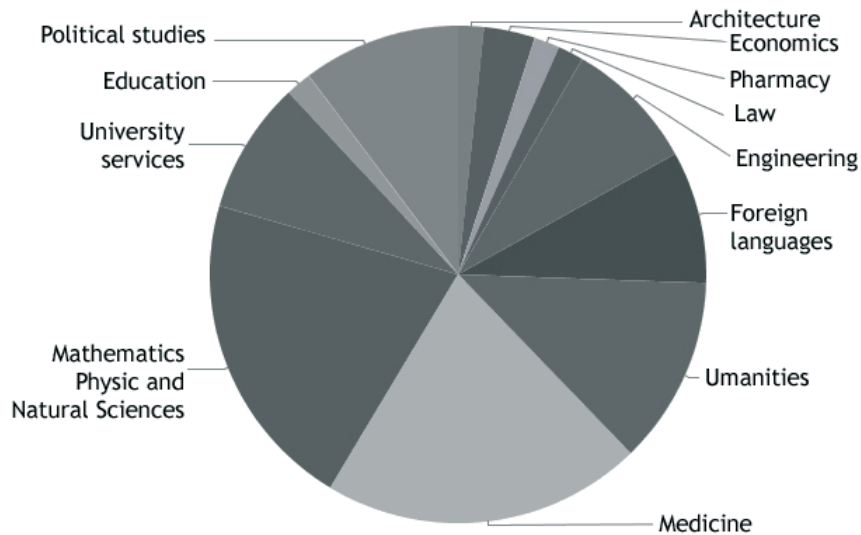


Fig. 1 Teachers involved grouped by faculty

Medicine, Mathematics, Physics and Natural Sciences are the most represented in WEL due to an early interest and experience in ICT by these contexts. However, the faculties of Languages and Humanities too feature a good number of courses. Since the distribution of WEL projects is homogeneously distributed, it is possible to affirm that the established opinion that humanities faculties are less keen on the use of ICT in education is no more true.

A further tool used to obtain data on courses involved in WEL was the project report that co-designers drew during the first individual conversation. The report is both an updating tool of teachers' opinion on e-courses and e-tivities and an opportunity for co-designers to list the main characteristics of the course.

Another tool was created to understand which were the teacher's preferences towards thematic seminars focused on selected technologies. This tool was implemented using *Doodle*.

#### 4 Outcomes of the WEL initiative

The comparison of initial profiling data with those gathered after the first design meeting allowed the following activities:

- identify tendencies and changes with respect to the methodological approach of the course and the activity type;
- put in relation the emerged tendencies with the levels of previous knowledge and experiences, discipline type, number of students and requests for further studies by teachers.

After the first cycle of conversations with teachers a general shift towards online and blended modalities was detected (respectively by 43% and 57%), to the detriment of the integrated approach, based on online delivery of generic support material (completely dismissed).

Actually, the chosen courses were not of the entirely online type – they included one or more online modules in which students' participation was an infeasible part of the learning path.

Data on selected approach for online activities (content-based, collaborative or mixed) show that in almost half cases<sup>1</sup> (44%), orientation expressed at the beginning was confirmed.

Instead the exposure to individual conversations and plenaries, changed the orientation in 56% of cases, out of which 36% chose the collaborative approach. On the whole, a preference for the collaborative approach was detected in 50% of cases, while the other half is equally distributed between content-based and mixed approaches.

Putting in relation the change in approach and the previous knowledge level

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<sup>1</sup> A case doesn't necessarily refer to a single teacher, rather to a single course/project which can be followed by more than one teacher as well. A single teacher can follow several courses/projects and choose a different approach for each course.

declared in the initial questionnaire, reveals that 60% of persons with high knowledge level stuck to their initial choice, while the remaining 40% shifted to the collaborative approach. Conversely, the percentage reverses among teachers with medium level knowledge, where 60% changes the approach, while two-thirds of persons with low competencies changed their approach. Hence a significant correlation between early knowledge level and propensity for change should be noted (Goodman-Kruskal tau: .673). A remarkable correlation is also present between approach change and the absence of early experience in the educational use of ICT (Goodman-Kruskal tau: .725).

Within this experience and putting in relation the chosen approach and the discipline the general belief according to which the content-based approach is more proper for scientific disciplines, and the collaborative one for humanities, seems to be denied. Although at first this tendency was present, at least for scientific disciplines, 60% featured a collaborative approach while over 40% of humanities courses featured the mixed approach.

Also reflections emerged during the design meetings about the approach in relation with the students' number, could have affected the choice and encouraged several teachers to modify it. Actually, if during the profiling phase teachers preferred a content-based approach independently of students' number, following the meetings, the choice for medium and low range groups fell mainly on the collaborative approach which is easily manageable with a small number of students. With respect to the other two approaches, as shown in Figure 2, the present choices for the content-based and for the mixed approaches increase consistently with the raise of the numerical range.

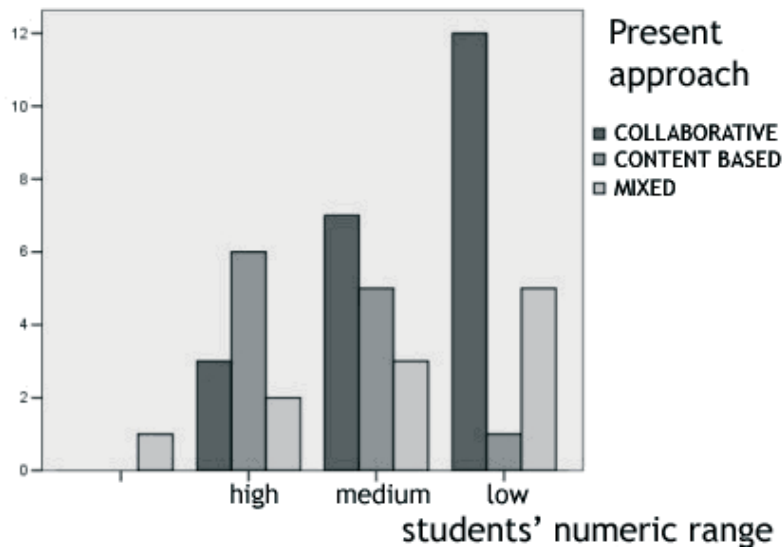


Fig. 2 Present orientations and students' amounts

Finally, as to the techno-methodological further studies in plenaries required by teachers, a remarkable interest towards topics consistent with the selected approach is confirmed, which does not exclude the need for further reflections on tools other than those related to their approach.

## 5 Conclusions

Follow-up analysis appears crucial to plan further developments of the research activity, which will be affected by modalities through which tasks designed by teachers will be carried out.

This medium-term analysis will establish to what extent teachers mastered the suggested methodology and succeeded in using it within their course; furthermore, whether and how much the approach has innovated their teaching practice and the employed learning strategies will be subject to evaluation.

In order to analyze these aspects objective data and qualitative inquiries will be carried out through proper surveys.

The comparison of numbers of students, drop-out rates, average marks in the intermediate tests, and success rates in exams, will be considered as objective data providing an immediate feedback on initiative outcomes.

For the qualitative enquiry, questionnaires will be distributed to:

- verify to what extent the choice made during the design phase has been confirmed;
- detect critical factors and potentialities;
- determine how problems emerged during implementation were solved, and whether these pertain to the specific discipline;
- verify what benefits students and teachers obtained from this experience in terms of satisfaction, participation at suggested activities and improvement of learning processes.

The research activity could further evolve through a long-term monitoring of courses and their use and reinforcement over time. Effects of the initiative at an institutional level could be investigated as well, with respect to the acknowledgement system of credits obtained online, the faculty members training policies, or infrastructures investments. Less formal effects could also be studied, i.e., the possible increase in training demand by teachers “infected” by colleagues who participated in the first edition of WEL.

Last but not least, the opportunity of establishing a permanent techno-methodological support service able to borrow and consolidate the experimented approach, should be considered. One of the main and indefeasible peculiarities of this action is the way in which the methodological competencies of instructional designers integrate with the technological ones peculiar to computer scientists, thus ensuring a qualified assistance to teachers in the design of their university courses.



## BIBLIOGRAPHY

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- Bongalos Y. Q., Bulaon D. D. R., Caledonio L. P., de Guzman A. B., Ogarte C. J. F. (2006) *University teachers' experiences in courseware development*, British Journal of Educational Technology, vol.37.
- Davis H. C., Fill K. (2007), *Embedding blended learning in a university's teaching culture: experiences and reflections*, British Journal of Educational Technology, vol.38.
- Harasim L. (1990), *Online education: perspectives on a new environments*, New York, Praeger.
- Howard J. (2002), *Technology-Enhanced Project-Based Learning in Teacher Education: Addressing the Goals of Transfer*, Journal of Technology and Teacher Education, vol. 10.
- Judge S., O'Bannon B. (2008), *Faculty integration of technology in teacher preparation: outcomes of a development model*, Technology, Pedagogy and Education, vol. 17.
- Kilpatrick W. H. (1918), *The project method*, New York, Columbia University Teachers College.
- Tobias P. V., Raath M. A., Moggi-Cecchi J., Doyle G. A., eds (2001), *Humanity from African Naissance to Coming Millennia*, Firenze, Florence University Press.
- Trentin G. (2006), *The Xanadu project: training faculty in the use of information and communication technology for university teaching*, Journal of Computer Assisted Learning, vol.22.