



Blended Learning: the Pilot Project of a School of Pharmacy

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Abstract

The University of Pavia has started an experimental project (Kiro Project) at the School of Pharmacy to improve the quality of learning through Web-based tools. Such a project, started in the second half of 2007, is now merging with a second one (Maieuta Project), starting on October 2008, with the aim to extend to all the students of the School of Pharmacy the advantages of blended and interactive learning. The paper presents the background and the methodological foundations of the project, the first results achieved, and the lines of pedagogical, management, and technological development which will make possible the extension of the initiative to the entire University.

1 Introduction

Kiro-Maieuta Projects propose to integrate traditional teaching by web based technologies (Schiederig, 2007). The objective is the creation of an integrated system aimed to improve both the rate and the quality of learning by taking advantage from the synergies between the lessons provided in classrooms and in-depth/exercise activities, self-evaluation, and online interaction.

The decision to undertake this path was suggested by several factors. The most important one was the consciousness of the increasing gap existing between conventional teaching and learning ways of the younger generation of students (Oblinger and Oblinger, 2005). Another important factor comes from the composition and typology of the students population, constituted not only by full time students, but also by numerous working students (who perform occasional work to support themselves in their studies) and worker students (who return to tackle university academic programs even though they work full time). Last but not least, we believe that a blended teaching system can be created and works much better if documents and learning materials are managed into a dedicated platform rather than being scattered across many servers as happens when the driving force towards the use of new technologies lacks strategic planning.

2 The main features of the project

The project is based upon the following principles:

- integration, i.e. enrichment, of the classroom learning experience. Such an approach agrees with what has emerged from recent European inquiries (E-lue – E-learning and university education – *University towards e-learning – a focus on Finland, France and Italy*, 2006) which have pointed out that the objective of elearning in the examined Universities consists in improving the quality and the flexibility of the students' learning experience (Ardizzone and Rivoltella, 2003);
- identification of the most receptive and in greatest need users: students in the first years of the degree courses (in particular, students with poor scholastic marks, worker-students, etc.);
- targeting the aims towards the methodological-didactic and pedagogic-educational aspects (Adams and Morgan, 2007): the attention given to the technological and engineering aspects does not represent the ends but the means;
- a digital learning environment flexible, modular, expandable, and, above all, modifiable according to the evolving requirements and growth of the project. Open Source software guarantees at the best all these requirements. Besides bringing together communities of shared interests and experience, it

is also made up of thousands of people in a position to give support and help to all those who are a part of it or who turn to it.

3 Learning by experience: planned objectives and their evolution

As an experimental project, Kiro has the goal of providing useful guidance as to its transformation from a pilot experience into a standardized and replicable process on an ever-increasing scale (Ellis *et al.*, 2006). To this end, and from the very beginning, the project group discussed the roles and relationships of the three key figures in the project: the student, the tutor, and the professor.

It is difficult to bring closer together the positions, which are sometimes very far apart, of one generation that has been defined as native digital (the students' generation) and another, the teachers' generation, which turns to the digital world as a migrant, and often with mistrust. The proposal advanced by several scholars who consider the native 'immobile' and aim only at the movement of the migrant towards the native seems excessive (Prensky, 2001). In our opinion, it is more appropriate to reflect on the possibility of a reciprocal movement of the roles nearer to each other. In Kiro's present configuration, the tutor plays a central role in the process of generational negotiations between the professor and the student. The tutor, if and when it is appropriate, recommends the introduction of new technologies into the learning system of the course, makes suggestions to the professor and to the student on the creation of new study and research methods (occasioned, for example, by the development of suitable Personal Knowledge Management environments), or points out web-based resources such as communities of practices and interests on the disciplines under discussion. Therefore, the objectives initially planned by the project have been reconsidered:

- to achieve a more flexible learning system;
- to facilitate, and personalize, the learning process;
- to strengthen the efficacy of learning activities;
- to increase the success rate of final examinations;
- to improve the effectiveness of the students' academic studies;
- to familiarize the students with the professional use of information technology;
- to train the students in the research, management, and sharing of information.

These objectives were partially achieved. In fact, the approach that has prevailed up to now can be defined as very 'formal', with pronounced top-down characteristics. The nature of the project itself – blended, and with many activities – introduces rigidity with regard to flexibility and personalization of the learning experience, even though the students have independently produced

a certain amount of content in the discussion forums. However, the viewpoint of the student is that personalization of his own learning path is the true innovative content of blended learning and constitutes the main tool to improve the effectiveness of his academic studies. This expectation has been satisfied by introducing more ‘informal’ and bottom-up approaches in our project. In particular, we placed, beside the different study ‘rooms’ made for the various courses, an online community (FarmaCo) where the student—thanks to the presence, at various levels of fading, of the animator/moderator tutors—takes on an active and prominent role in the research/use/commentary/exchange of the particular resources of the scientific discipline under discussion, so creating contents in collaboration with his fellow students. Here, each student has the possibility to stand out in the eyes of his fellow students as a leader and in this way to gain a reputation as an authority.

As an incentive to maximize the creative involvement of each student, any contributions on the study subjects, after validation by the professor, is ‘exported’ by the community, placed in the ‘formal’ rooms of the courses and identified by the student’s name. The goal of the tutor—whose key role is very clear at this point—consists not only in facilitating and stimulating interactions, but also in ‘monitoring’ the activities in progress and taking back into the various related courses the best and most interesting developments in the community, in such a way that even the more ‘formal’ students (who, probably, have never entered into the community) can equally enjoy the benefits produced by their fellow students.

4 Upgrading kiro project into kiro-maieuta project

Both a blended and a conventional learning system have a common knowledge source: the professor. They greatly differ, however, for what concerns the ways and the means by which such a knowledge is disclosed. In a conventional learning system, the professor plays both the role of knowledge manager and that of communication manager. In a blended system, on the contrary, the knowledge manager is again the professor, but the communication manager of the web-based activity is another person (the tutor) with technical skills on the medium (the web) and on the technologies used in the medium (digitalization technologies).

We believe that both the effectiveness and the quality of a blended learning system can be maximized if both the professor and the tutor are so deeply involved in the planning of the learning strategies as to generate a true educational team (Hagner, 2000). In this way, the impact of both the actors on the course would be always active and at the maximum level. However, to make it possible such a structural and continuous professor/tutor collaboration, the role of the

tutor must be upgraded to satisfy new demanding requirements which can not be satisfied by a “general purpose” tutor but only by skilled tutors which can be thought of as follows:

- the strategic tutor: a high-level professional figure, who will hold the strategic role of counselor to the professors regarding digital technologies applicable to teaching;
- the tactical tutor: an intermediate-level figure, who will maintain the original Kiro project features;
- the basic tutor: a basic-level figure, who, after receiving instruction, collaborates with the professor in the day by day activity and works as user friendly interface for the students.

Such an evolution is actually performed by merging the new Maieuta project into the Kiro project. The Maieuta Project is mainly aimed to improve and extend the effects of the Kiro project: six strategic tutors have already been recruited and formed and they are just beginning to instruct the basic tutors (about 30) ad to support the professors in the strategic planning of the courses. In addition to building a real team of new professional figures of technological and strategic/teaching support for the University professor (Khan, 2005), the Kiro-Maieuta project will allow the implementation of an expandable and modular model able to meet the challenges of the quantitative and qualitative growth of the initiative.

5 The kiro-maieuta project at work: actions and objectives

After attention has been directed towards the actors, it is necessary now to observe the phenomenon from the point of view of the actions and their objectives. The purpose is to monitor over time the performance of the student, with the aim of calibrating and personalizing the support actions with time and methods suitable to the specific cases. The expansion and strengthening of the effects of project Kiro, as up to now outlined, are already in progress with targeted tutorial actions. These are made possible by means of Data Mining processes, that is, through the analysis of information relating to the academic studies of the students extracted from the Oracle *legacy* database and properly ‘treated’ in a Data Warehouse subordinate system (Kimball and Margy, 2002). For analysis, Data Mining techniques are used, predominantly based upon Decision Trees or Naive Bayes (Tan *et al.*, 2005). In this way tutorial actions, in addition to the normal activity in each course, will be well timed, oriented towards the temporary and specific problems of the students, and will start on the basis of inconsistent performance (in a negative sense) with the expected results in the student’s academic studies. Students in need of assistance, identified thanks to the continuous monitoring system, will have the opportunity to

attend personalized assistance programs based on the Web and with a personal tutor, just for the period of difficulty in the academic programs.

In this way, a viewpoint of care and continuous relationship with the student is established (Student Relationship Management). Since all of this has been put into effect and managed with the technologies connected to e-learning, it is possible to speak of an e-StReMa viewpoint: that is to say, Extreme E-learning, which will carry out its actions according to the following guidelines:

- start action: identification, by means of appropriate entry tests, of the possible lack of academic preparation. In such a case, the E-Xtreme action first comes into play by leading the student into a personalized learning assistance programs with in-progress verification of the improvement achieved;
- in-progress action: creation of a student performance database. The first quantitative signal (credits achieved in a certain period of time below a predefined threshold and/or marks on exams in negative variance with an expected average) makes possible a qualitative inquiry aimed at identifying the reason for the deterioration in performance and, consequently, the placement into one of the assistance programs identified thanks to prior methodological analysis;
- predictive action: identification of performance interrogative/predictive algorithms on the basis of predefined situations, in such a way as to be able to predict over time the problems in the study programs and to take action with corrective tools (the reliability of a such predictive action will increase with the expansion of the available database);
- recursive action for quality evaluation: control and verification tools of the usefulness of the support actions. Such evaluation could occur, in the beginning stage of the project, through the comparison of the results obtained between a 'pilot' group of students and the remaining control group. The long-term solution is through a constant monitoring of a series of KPIs (Key Performance Indicators) suitably defined.

6 Conclusions

The pilot project of the Faculty of Pharmacy (Kiro Project), aimed to improve the quality and the results of learning by integrating conventional classroom teaching with ICT, has been extensively described. The background, the general organization and the central role of the tutors in the project have been discussed. The analysis of the obtained results gives feedbacks for project optimization and addresses the pedagogical and technological development to be accomplished for the extension of the project to the entire University.

BIBLIOGRAPHY

- Adams J., Morgan G. (2007), “*Second Generation*” *E-Learning: Characteristics and Design Principles for Supporting Management Soft-Skills Development*, Chesapeake, VA, International Journal on E-Learning. 6 (2), 157-185.
- Ardizzone P., Rivoltella P.C. (2003), *Didattiche per l’e-learning: metodi e strumenti per l’innovazione dell’insegnamento universitario*, Roma, Carocci.
- Ellis R. A., Jarkey N., Mahony M. J., Peat M., Sheely S. (2007), *Managing quality improvement of eLearning in a large, campus-based university*, Quality in Higher Education, Vol. 15, No. 1, 9–23.
- E-lue - E-learning and university education – (2006), *University towards e-learning: a focus on Finland, France and Italy*, URL: http://www.fondazionecrui.it/elue/31_may_2006.htm (accessed on 21st August 2008).
- Hagner P. R. (2000), *Faculty engagement and support in the new learning environment*, Educause Review, Vol. 35, September/October, 26–34.
- Khan B. H. (2004), *E-learning: progettazione e gestione*, Trento, Erickson.
- Kimball R., Margy R. (2002), *The Data Warehouse Toolkit, 2nd edition*, New York, Wiley.
- Oblinger D. G., Oblinger, J. L. (2005), *Educating the Net Generation*, E-book © 2005 EDUCAUSE, ISBN 0-9672853-2-1, Available electronically at URL: <http://www.educause.edu/educatingthenetgen/> (accessed on 21st August 2008).
- Prensky M. (2001), *Digital Natives, Digital Immigrants*, On the Horizon Vol. 9 No. 5, NCB University Press.
- Schiederig K. (2007), *Using e-learning for social sciences: practical lessons from the Free University of Berlin*, eLearning Papers, no. 3. 2007, <http://www.elearningeuropa.info/files/media/media11894.pdf> (accessed on 21st August 2008).
- Tan P. N., Steinbach M., Kumar V. (2005), *Introduction to Data Mining*, Pearson International Edition /Addison-Wesley.