

## Collaborative Learning Environments for Teacher Education

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It is in this context that we aim to present a case study of continuous training for teachers, carried out within a b-learning framework. In this presentation, we shall present and discuss the concepts related to this approach to teacher education. We shall also present the structure of the platform used for collaborative work, characterise the participants in this research and illustrate the kind of activities and tasks that were conducted by approximately forty teachers in two continuous courses for professional development.

Finally, we intend to address a number of reflections emerging from the data collected, including: i) the functionality of the platform; ii) the constraint factors that can affect collaborative learning in such an environment; iii) the changes in the role of the teacher as educator; iv) the changes in the role of the teacher as learner; v) the development of new pedagogical interrelations; vi) the complexity of collaborative learning.

**Keywords** collaborative learning; b-learning; virtual communities, teacher training.

### 1. Introduction

Technological and pedagogical innovation has enabled the development of virtual environments that bring about the possibility of learning with others at a distance. The development of these virtual environments is nowadays an expanding field of research. Continuous training of teachers is a highly suitable field of application for these new ways of promoting learning. Despite the indefinite nature of these new ways of learning, which is but typical of new environments, collaborative learning is being recognised as quite important within professional contexts as means of answering educational needs of the information society. The development of these environments based on the creation of virtual learning communities and their collaborative activities must be the object of further study to guarantee the success of its inclusion in professional development, therefore to improve teacher practice. This following work is intended to contribute in this sense.

### 2. A new context for teachers' professional development

The teachers' capacity of assuming their own professional development seems to be connected, on the one hand, with their preparation for the transformations that are taking place very rapidly, and, on the other, with the obstacles which might affect that professional development and with educational change within the current training perspective.

The current context for professional development seems to be related to professional "dilemmas", to professional culture and to the organisational structure of educational institutions. The ongoing changes in society and in its respective educational systems are a challenge for redefining the teachers' job, their training and professional development. A job traditionally marked by individualism and by difficulties in learning from and with others demands a change in professional culture. The job of being a teacher faces an array of interrelated "dilemmas" that can work as obstacles to their professional development, such as the intensification of teachers' work, continuous training, working conditions and constant educational reforms. The comprehension of these situations can be challenging so as to avoid presenting solutions without previously having the necessary wide vision which enables this understanding of the problems.

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The traditional education institutions, described as being inert, do not seem to have a suitable background which would allow them to answer the demands of information society and of the rising model of learning throughout life. The professional of education does not work alone, but interacts with other professionals. Therefore, promoting their training involves not only the individual, but also their relationship with others, the group, the organisation, the institution and the context. [2] Collaborative culture is very much related to team work, a fact which demands new social abilities.

This collaborative competence matches a generalised idea of abandoning the conception of an individualistic and isolated job and moves towards more collaborative cultures. Such abandonment is identified by the European Union as a necessary condition for the schools' transformation into learning organisations [3]. "A fundamental task to create cultures for education interchange consists of stimulating working relations based more on cooperation between school directors and teachers and among teachers themselves" [4].

One of the most widely discussed aspects about teacher training has perhaps been their need for developing competences concerning the use of digital technologies. Since their beginning and implementation in society, these technologies have always put pressure on the school and on the teachers' personal development, leading to different reactions within the professionals of education.

Nowadays, there is a certain interconnection and interdependence of training processes throughout life with regard to the potential of information and communication technologies in shaping new educational spaces and scenarios, capable of changing the ones that exist, which are no longer valid options, so as to face the information society's new contexts. The option of electronic training used in distance learning can turn into useful tools to stimulate both training innovation and professional development of teachers. These ways of accessing, producing and disseminating information also require new competences from professionals of education, which is a change in the learning scenarios and the creation of new training approaches.

In order to achieve wider implementation, the modality of e-learning should demonstrate that it is much more than just a way of accessing information. The key to e-learning success does not lie in unlimited access to information, even if this represents a huge potential. Nevertheless, this issue has drawn a veil over pedagogical and contextual questions [5]. The focus on information and on transmission processes suggest a serious concern with contents, its organisation and ways of presentation, thus undervaluing the joint processes of learning construction and interaction [6].

The future of learning enriched by ICT (Information and Communication Technologies) lies not only in the production and distribution of contents but also in learning contexts that one manages to create when using these technologies [7]. It is by means of this line of thought that one can predict the success of virtual learning environments, which supports the running of virtual communities based on collaborative learning. We believe that the understanding of teacher training in collaborative environments at a distance could be highly interesting in order to solve some of the (currently widely debated) training problems, to implement their establishment in a large scale and, finally, to try to overcome a few space and time contingencies, which can seriously limit teacher training throughout life.

### 3. Description of the study

The reflection elements of this work come from wider research, using the methodology of case studies, in which two situations of teacher continuous training were analysed with the purpose of understanding how teachers' professional development takes place in collaborative learning environments at a distance. In case studies, the results are very much related to the context. Despite that, we think that the knowledge gained should be taken into account in the implementation of learning environments of the same kind.

The above-mentioned training was given credits by the Scientific and Pedagogical Board for Continuous Training and took place in the Centre of Continuous Training in the *Escola Superior de Educação de Bragança* (Graduate School of Education of Bragança).

The first workshop (training 1) took place between July and November 2004 and the second one (training 2) between April and July 2005. Training was conducted in the b-learning modality, being that each workshop had a 20-hour in situ component and a 40-hour distance component.

Despite the fact that learning models based on virtual environments are becoming more and more common, the current trend with regard to distance training enjoys a huge popularity in b-learning. For some authors, b-learning is seen as an intermediate solution that tries to take advantage of the best in both in situ and distance training [8]. It also arises as a temporary solution, or as a path that one must gradually cross towards e-learning, in as far as trainees develop their technological and learning self-management competences. B-learning is in this case a transition modality.

We cannot forget that those who are not familiar with this type of training and with this technology need a more cognitive involvement in the activities. B-learning will therefore play the role of a transition modality towards modalities only done at a distance, as long as training competences are developed and both technologies and communication processes at a distance are dominated. In this training model, the trainer must perform pedagogical, social, technical and organisational functions. The trainer's attitude must be a proactive one, trying to be a trainee himself in each group and intending to encourage and stimulate trainees' participation and engagement in collaborative work.

### 3.1 The platform used

The collaborative environment at a distance was created by using a platform built by a LCMS (Learning Content Management System) and a Groupware. The collaborative learning environment was then developed from the platforms ATutor and ACollab in integration (working from the same database) in the Apache server. These platforms are OpenSource tools with GPL license (General Public License) developed by the University of Toronto (<http://www.atutor.ca>). The ATutor is an LCMS that uses SCORM specifications to develop contents. In our case, it was mainly used for this purpose.

ACollab is a collaborative environment (Groupware): a multi-group Web-based collaborative environment. It is a quite open and flexible structure for the creation and management of working groups and for the organisation of collaborative activities, by using forums, e-mail inboxes, information areas, scheduling of events, chats and the joint preparation of documents with comments on the work in process. It also possesses a library where documents and finished papers are made available.

### 3.2 Characterisation of the participants

In training 1, there were 16 trainees in which the most representative age category was 36-45 years old (seven people), plus two older trainees than this category and plus another three in the 25-36 category. In training 2, there were 18 trainees and the most representative age category was 25-35 years old (eight people) plus one trainee of more than 45 years old. The age of the participants can be a relevant factor in the implementation of new processes, since age is a question that influences the way teachers act when educational change occurs [9] and necessarily in following these new processes.

The teaching level to which trainees belonged was diversified. There was no trainee from kindergarten education; in short, all teaching levels were represented, with the tertiary level included (in training 2).

As far as the Internet use for professional purposes is concerned, all trainees stated that they used it, although some hardly did so. Nevertheless, the majority of them used the Internet quite a lot and several participants said that they used it on a daily basis.

There was also a tendency for teachers to consider that they were capable of using the Internet without considerable difficulties: web navigation, searches, e-mail. Some more advanced tools, such as dealing with forums, videoconference and chats, were reported as being extremely difficult for the greater part of the trainees. The domain of communication technology can influence training success, since good experience with handling communication tools can reduce the effort expended both in tools of communication and the platform work tools.

Tools for gathering information were used, such as electronic records from the platform, individual interviews, group feedback and research diary. The electronic records were used for frequency analysis and their content was analysed together with the information gathered with other instruments by using the data analysis program NUD\*IST.

#### 4. Research Product

In our study, the backup platform for creating this collaborative environment worked for collaborative work at a distance. Despite the fact that some communication tools were more used than others, because they were more appropriate for some kind of activities than others, we must emphasise the complementariness and the importance of using these tools in an integrated way. Thus, the limitations for the development of collaborative learning were not imputed to the platform's technological and communicational environment, but to other aspects that were alien to the platform in question.

We must be aware that there is a whole array of factors that can influence the success of applications of this kind. We identified some of these in our study and tried to understand to what extent they can influence the conditions of success of the training to which we have referred. Despite our efforts in trying to understand their influence, they cannot be seen in an isolated way for their influence acts in an interlinked way.

One of the limitations reported was the teacher's *technology domain*. The teacher's inability to control computer tools limits their capacity of engagement in collaborative work at a distance. Another aspect that must be taken into account, in these innovation processes when it refers to teacher training done in collaborative environments, is the professional culture, namely *individualism* as a work culture. The absence of a collaborative culture in school work is a problem identified in the teachers who participated in our study. *Professional instability* is another relevant aspect that one must bear in mind at the moment of implementing these innovative processes. Professional instability seems to be brought about by a whole range of factors that are interconnected, such as the professional situation, teacher's placement, the political and social incomprehension and the changes in teacher's work. These were factors that led to the lack of motivation, lack of interest and a certain negative feeling among teachers and therefore to a lower involvement and participation. These factors affect the inherent motivation which is necessary for the success of innovative projects and for the creation of collaborative dynamics. The *devaluation of credited continuous training* was another factor reported by trainees. In the opinion of those who participated in the study, this training modality has a much stronger connection with external motivation factors, because it aims at climbing the career ladder, than inherent factors, though these were responsible for the interest in professional development. As far as *ICT accessibility in the workplace* is concerned, we realised that the availability of ICT to be used by the trainees in their training was relatively limited. What really happens in schools, as workplaces, is that they are not ready to work as training places because they don't have enough resources, either in quality or in quantity, for being used by teachers whenever they need them. Teachers' *working routines* also seem to affect work at a distance. In spite of its association with the current professional culture, like individualism, we emphasise a type of analysis based more on interpretation, which is dependent on working in situ and on the difficulty in managing asynchronous communication time and its relationship to collaborative dynamics at a distance. As far as the function of trainers is concerned, we found that the proactive attitude and the accumulation of tasks caused work overload, which lead them to stay online almost constantly in order to furnish trainees with answers to their doubts.

Both for trainers and trainees, participation time was not restricted to certain hours, but it ran over many hours of the day and every day of the week, depending on their availability and the temporal organisation of the work. All the time is training time, therefore the flux of messages is not continuous and if some periods have great activity, others have little participation. As a consequence, both trainers and trainees' work spreads over time and gets intensified a lot in some other moments.

For trainees, the involvement and regular participation seemed to be necessary for the collaborative learning process. The learning rhythm in collaborative environments seems to require regular

participation because all elements establish relationships with each other. In this aspect, collaborative learning seems to distinguish itself from individual learning on e-learning systems, where learning rhythms and time flow do not influence the learning of other participants and can be the object of wider variation, according to the interest of trainees. In collaborative environments, trainees are responsible not only for their training but also for the others. The didactic relationship is changed by the fact that teachers and trainees assume new roles in mediated environments, and also by the introduction of the group as a central element in the traditional pedagogical triangle: trainer – trainee – knowledge [10]. With the introduction of the group element, what is in question is not only the dissemination of information but also the process, in which the joint construction of knowledge becomes essential, since trainers must deal with both the individual and group needs and trainees begin to be in charge not only of their training but also of that of others, in truly interactive environments.

## 5. Conclusion

In our investigation, we realised that there are technological tools capable of helping in the implementation of collaborative learning at a distance. However, this learning success can be affected by a whole range of factors throughout the course of its establishment. These factors are linked with the habit of working in situ and the culture of organising work that traditionally occur in schools. It was also striking that teachers needed to be better prepared in the domain of communication technology. The working “dilemmas” of teachers, characteristic of our times, as elements that can affect their motivation, do not help collaborative teaching. Together with these factors, one other is related to school management, which is not prepared to release teachers for professional development in the workplace. We also recognised that learning in these collaborative environments seems to be more demanding and complex in relation to the need for cognitive presence of the participants involved. In other words, it involves other necessities different from the individual training based on e-learning systems and demands both the roles of trainers and trainees to be played and a more complex didactic relationship to be established. It is fundamental in ongoing learning construction in the new information society to develop a collaborative networking culture focussing on human intervention and interaction and integrating the sharing of knowledge and experience between professionals with the same concerns and objectives. To follow this path, it is of great importance to debate professional training questions in information technologies, school restructuring and reculturing, as well as work-related time organisation and time for training.

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